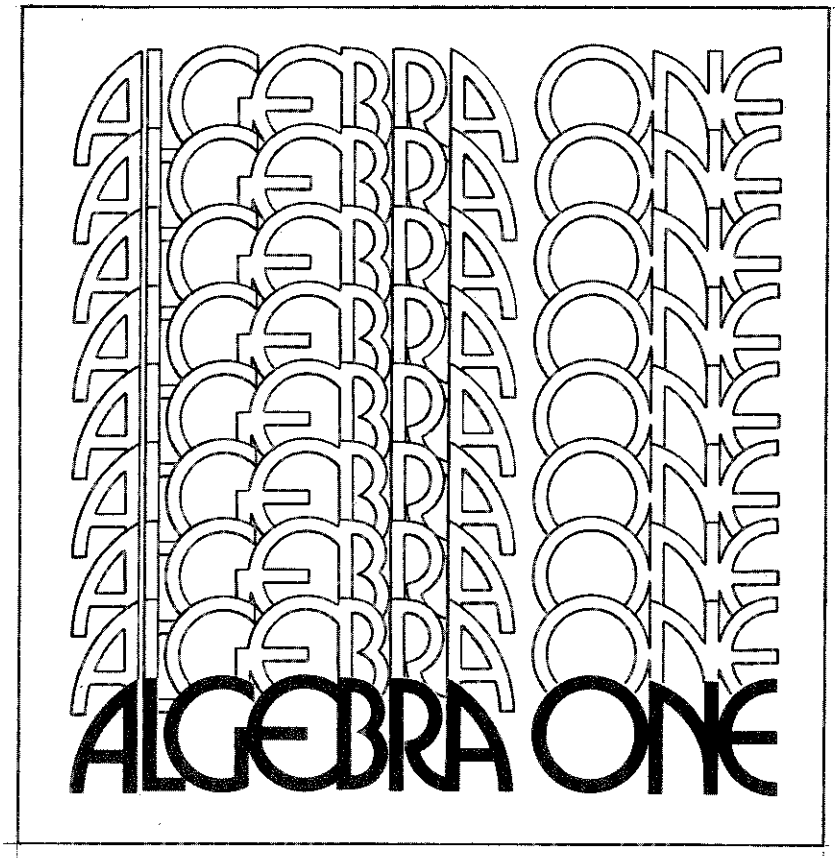
MAKING PRACTICE FUN

by Ray Chayo



If you would like help correlating Making Practice Fun to your algebra text, simply write to the Mathematics Department, Addison Wesley Publishing Company, Sand Hill Road, Menlo Park, California 94025.

The author wishes to thank Yong Cha Kim for her assistance in planning the art work for the Dot-to-Dot puzzles.

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CONTENTS

The sequence of topics in these practice pages follows that of most algebra texts. Inspection of the page itself will be sufficient to determine its suitability for your class.

The masters are grouped as follows.

Making Practice Fun 1 Name _____

Whole Numbers—Adding, Subtracting, Multiplying, Dividing

CROSS NUMBER PUZZLE

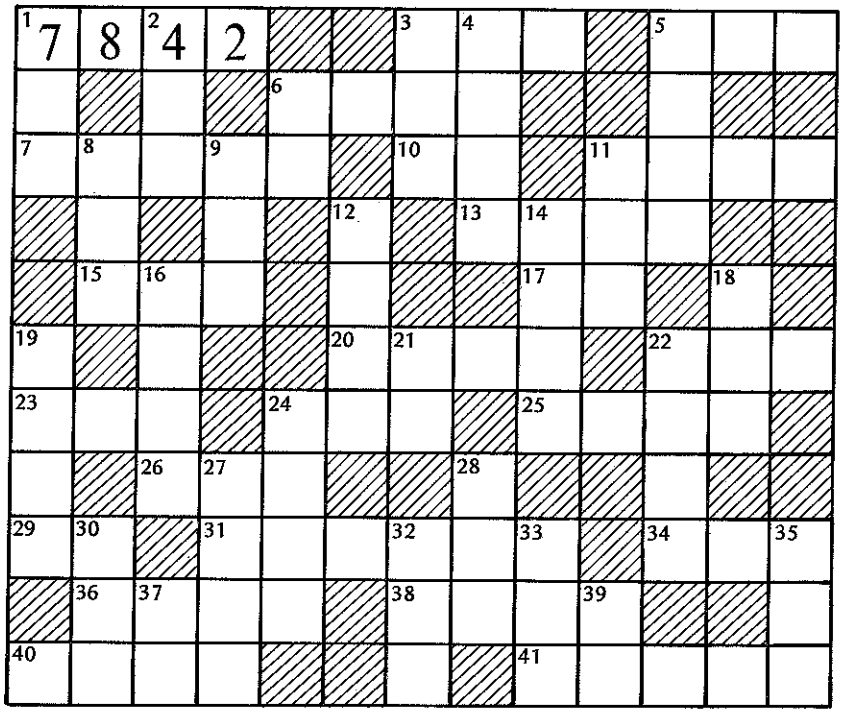
1. Work each exercise.
2. Write the answer in the correct squares.

Across

1. 1307 × 6 = 7842
3. 906 – 477
5. 344 + 195 + 349
6. 4419 ÷ 3
7. 100,000 – 43,861
10. 9964 ÷ 212
11. 1009 + 992 + 1245
13. 5000 – 1329
15. 12 × 72
17. 16 + 48 + 29
20. 223 × 8
22. 5145 ÷ 35
23. 1111 – 995
24. 69 + 169 + 269
25. 11 × 232
26. 600 – 14
29. 48,210 ÷ 3214
31. 45,575 + 106,259
34. 917 – 333
36. 622 × 12
38. 8000 – 921
40. 103,200 ÷ 30
41. 28,800 + 346 + 27,519

Down

1. 149 × 5
2. 520 – 49
3. 95 + 88 + 291
4. 8484 – 6111
5. 2807 × 3
6. 4047 ÷ 213
8. 12 × 54
9. 1000 – 606
11. 26 + 55 + 292
12. 10,000 – 1290
14. 1157 × 6
16. 12,930 ÷ 2
18. 507 + 161 + 174
19. 11 × 101
21. 24,332 ÷ 316
22. 63 × 25
24. 8121 – 2467
27. 272 × 30
28. 555 + 255 + 120
30. 909 – 335
32. 293 × 3
33. 95 × 5
35. 25 × 19
37. 15,444 ÷ 351
39. 1016 – 920



Making Practice Fun 2 Name _____

Fractional Notation—Adding, Subtracting, Multiplying

MESSAGE IN CODE

1. Work each exercise and simplify the answer.
2. Find the code letter for that answer.
3. Write the code letter in the blank by the exercise number. You may use the same code letter several times.

Exercises

T 1. $\frac{3}{4} \cdot \frac{2}{3} = \frac{1}{2}$

2. $\frac{3}{5} \cdot \frac{1}{2}$
3. $\frac{7}{11} \cdot \frac{2}{3}$
4. $\frac{1}{4} \cdot \frac{2}{5}$
5. $\frac{6}{5} \cdot \frac{1}{4}$
6. $\frac{1}{8} \cdot \frac{8}{9}$
7. $\frac{1}{3} + \frac{1}{3}$
8. $\frac{1}{2} + \frac{1}{3}$
9. $\frac{3}{5} + \frac{1}{2}$
10. $\frac{1}{4} + \frac{3}{4}$
11. $\frac{1}{4} + \frac{1}{4}$
12. $\frac{2}{3} - \frac{1}{3}$
13. $\frac{3}{4} - \frac{1}{2}$
14. $\frac{5}{8} - \frac{1}{2}$
15. $\frac{6}{7} - \frac{1}{3}$
16. $\frac{31}{24} - \frac{5}{8}$
17. $\frac{4}{5} \cdot \frac{7}{12}$
18. $\frac{4}{5} \cdot \frac{3}{8}$
19. $\frac{1}{2} \cdot \frac{1}{4}$
20. $\frac{7}{3} \cdot \frac{11}{49}$
21. $\frac{5}{6} \cdot \frac{6}{15}$
22. $\frac{3}{5} \cdot \frac{1}{6}$
23. $\frac{1}{3} + \frac{23}{30}$
24. $\frac{3}{4} + \frac{5}{20}$
25. $\frac{1}{6} + \frac{2}{15}$
26. $\frac{1}{8} + \frac{1}{3}$
27. $\frac{7}{15} + \frac{1}{5}$
28. $\frac{2}{7} + \frac{5}{21}$
29. $\frac{1}{3} + \frac{1}{11}$
30. $\frac{7}{9} - \frac{2}{3}$
31. $\frac{3}{7} - \frac{2}{7}$
32. $\frac{7}{10} - \frac{3}{5}$
33. $\frac{1}{5} - \frac{1}{10}$
34. $\frac{20}{36} - \frac{1}{18}$
35. $\frac{9}{5} \cdot \frac{1}{6}$
36. $\frac{7}{8} \cdot \frac{8}{7}$
37. $\frac{2}{3} \cdot \frac{9}{20}$
38. $\frac{1}{4} \cdot \frac{1}{4}$
39. $\frac{2}{11} \cdot \frac{7}{3}$
40. $\frac{1}{30} + \frac{1}{15}$
41. $\frac{1}{25} + \frac{3}{50}$
42. $\frac{1}{6} + \frac{1}{12}$
43. $\frac{3}{36} + \frac{1}{36}$
44. $\frac{10}{32} + \frac{6}{32}$
45. $\frac{5}{7} - \frac{4}{7}$
46. $\frac{4}{5} - \frac{7}{10}$
47. $\frac{7}{8} - \frac{3}{4}$
48. $\frac{1}{2} - \frac{1}{5}$
49. $\frac{7}{12} - \frac{1}{4}$
50. $\frac{3}{5} \cdot \frac{2}{7}$
51. $\frac{35}{18} \cdot \frac{3}{7}$
52. $\frac{33}{42} \cdot \frac{2}{3}$
53. $\frac{7}{15} \cdot \frac{3}{14}$
54. $\frac{1}{3} \cdot \frac{1}{3}$
55. $\frac{9}{5} \cdot \frac{2}{12}$
56. $\frac{11}{12} \cdot \frac{1}{2}$
57. $\frac{7}{40} + \frac{5}{40}$
58. $\frac{5}{4} - \frac{19}{16}$

Code Letter	Simplified Answer
A	$\frac{3}{10}$
B	$\frac{7}{10}$
C	2
D	1
E	$\frac{1}{10}$
F	$\frac{1}{8}$
G	$\frac{8}{21}$
H	$\frac{1}{7}$
I	$\frac{1}{3}$
J	$\frac{1}{5}$
K	$\frac{14}{33}$
L	$\frac{6}{35}$
M	$\frac{7}{15}$
N	$1\frac{1}{10}$
O	$\frac{2}{3}$
P	$\frac{1}{4}$
Q	$\frac{19}{33}$
R	$\frac{11}{21}$
S	$\frac{1}{9}$
T	$\frac{1}{2}$
U	$\frac{5}{6}$
V	$\frac{13}{24}$
W	$\frac{11}{24}$
X	$\frac{3}{8}$
Y	$\frac{1}{16}$

Making Practice Fun 3

Name _____

Expanded Notation with Exponents

SECRET MESSAGE

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Write expanded notation with exponents.

1. $568 = 5 \times 10^2 + 6 \times 10 + 8$ **T**
2. 4021
3. 1265
4. 2004
5. 11,011
6. 19,000
7. 79
8. 287,140
9. 4676
10. 80
11. 82,031
12. 240,000
13. 155
14. 400
15. 126

Code Letter	Expanded Notation
A	$2 \times 10^3 + 4$
C	$1 \times 10^4 + 1 \times 10^3 + 1 \times 10 + 1$
E	$1 \times 10^4 + 9 \times 10^3$
F	$1 \times 10^3 + 2 \times 10^2 + 6 \times 10 + 5$
H	$8 \times 10^4 + 2 \times 10^3 + 3 \times 10 + 1$
I	$1 \times 10^2 + 5 \times 10 + 5$
K	$4 \times 10^3 + 6 \times 10^2 + 7 \times 10 + 6$
L	$1 \times 10^2 + 2 \times 10 + 6$
N	$7 \times 10 + 9$
O	$2 \times 10^5 + 8 \times 10^4 + 7 \times 10^3 + 1 \times 10^2 + 4 \times 10$
P	4×10^2
R	$2 \times 10^5 + 4 \times 10^4$
S	$4 \times 10^3 + 2 \times 10 + 1$
T	$5 \times 10^2 + 6 \times 10 + 8$
W	8×10

$\underline{\quad}\ \underline{\quad}\ \underline{\quad}\ \underline{\quad}\ \underline{\quad}\quad \underline{\quad}\ \underline{\quad}\ \underline{\quad}\ \underline{\quad}\ \underline{\quad}$!
9 7 8 5 9 9 7 8 5 9

$\underline{\quad}\ \underline{\quad}\ \underline{\quad}\ \underline{\quad}\quad \underline{T}\ \underline{\quad}\ \underline{\quad}\ \underline{\quad}\ \underline{\quad}$?
10 11 8 2 1 11 6 12 6

$\underline{\quad}\ \underline{\quad}\ \underline{\quad}\ \underline{T}\ \underline{\quad}$.
4 7 13 1 4

$\underline{\quad}\ \underline{\quad}\ \underline{\quad}\ \underline{T}\ \underline{\quad}\quad \underline{\quad}\ \underline{\quad}\ \underline{\quad}$?
4 7 13 1 4 10 11 8

$\underline{\quad}\ \underline{\quad}\ \underline{\quad}\ \underline{T}\ \underline{\quad}\quad \underline{\quad}\ \underline{\quad}\ \underline{T}\quad \underline{\quad}\ \underline{\quad}\quad \underline{\quad}\ \underline{\quad}\ \underline{\quad}\ \underline{\quad}$!
4 7 13 1 4 15 8 1 8 3 11 6 15 14

Making Practice Fun 4 Name_____

Convert from Decimal to Fractional Notation or from Fractional to Decimal Notation

DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer in the exercise and connect the dots in order.

Exercises

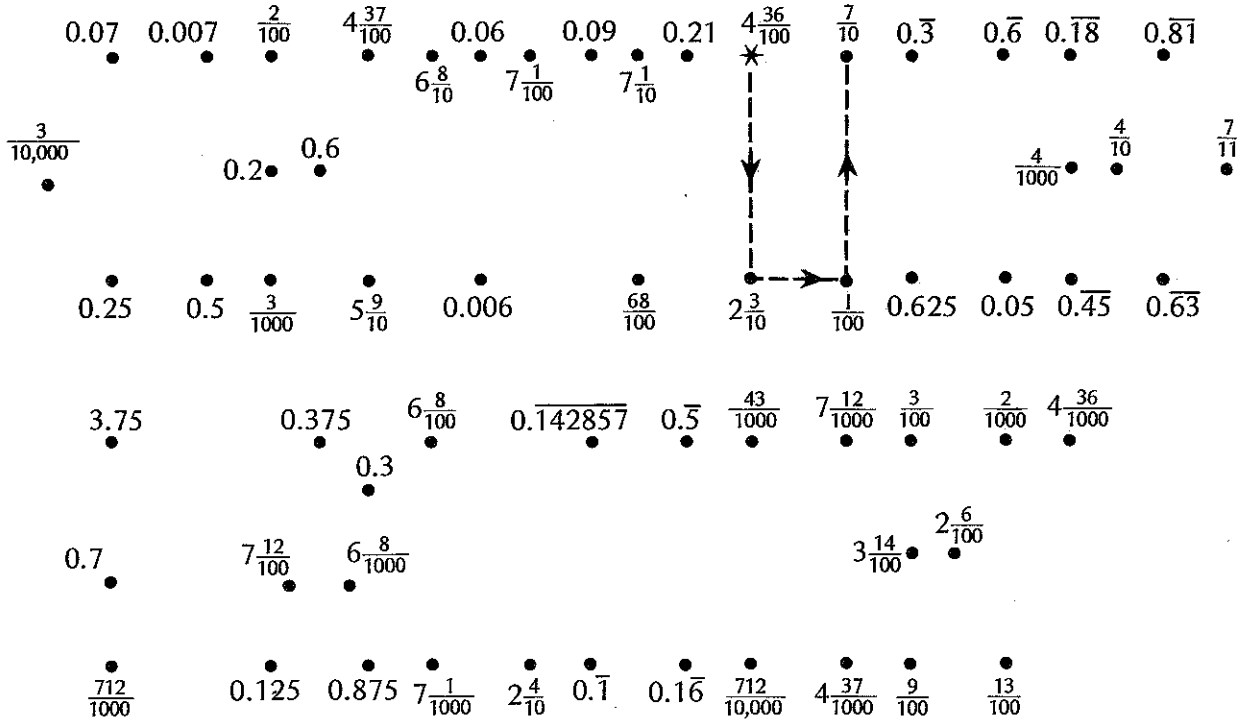
Write fractional notation.

1. 4.36 to 2.3 to 0.01 to 0.7 $4\frac{36}{100}, 2\frac{3}{10}, \frac{1}{100}, \frac{7}{10}$
2. 0.002 to 0.03 to 0.09 to 0.13
3. 6.8 to 7.01
4. 6.08 to 7.001 to 2.4
5. 0.68 to 7.1
6. 4.37 to 0.02 to 0.003 to 5.9
7. 0.004 to 0.4
8. 7.012 to 4.037 to 0.043 to 0.0712
9. 7.12 to 6.008
10. 3.14 to 2.06

Write decimal notation.

11. $\frac{7}{100}$ to $\frac{1}{4}$ to $\frac{1}{2}$
12. $\frac{1}{8}$ to $\frac{3}{8}$ to $\frac{7}{8}$
13. $\frac{3}{5}$ to $\frac{1}{5}$
14. $\frac{1}{7}$ to $\frac{5}{9}$
15. $\frac{2}{3}$ to $\frac{1}{3}$ to $\frac{5}{8}$ to $\frac{5}{100}$
16. $\frac{6}{100}$ to $\frac{6}{1000}$
17. $\frac{5}{9}$ to $\frac{1}{6}$ to $\frac{1}{9}$ to $\frac{1}{7}$
18. $\frac{9}{11}$ to $\frac{2}{11}$ to $\frac{5}{11}$ to $\frac{7}{11}$
19. $\frac{9}{100}$ to $\frac{21}{100}$

What are the ingredients of a honeymoon salad?



Making Practice Fun 5 Name_____

Parentheses, Grouping, and Order—Adding, Multiplying

NUMBER PUZZLE

1. Work each exercise.
2. Circle the answer. The digits of each answer are in a straight line forward, backward, up, down, or diagonally.

Exercises

1. (86 + 74) + 26 = 186
2. (342 + 398) + 602
3. (23 × 6) + (23 × 4)
4. (98 × 17) + (2 × 17)
5. 8312 − (112 + 200)
6. (10 × 8) + 14
7. (79 × 68) + (79 × 32)
8. 34 + 25 + 66 + 75
9. 32,132 − (82 + 50)
10. 415 + 235 + 585
11. (7 × 5) + (13 × 5)
12. (89 × 37) + (89 × 63)
13. 7 + 6 + 3 + 14 + 9 + 8 + 1 + 2
14. (12 × 12) + (12 × 7) + (12 × 1)
15. (152,364 + 400) + 600
16. (11,100 + 100,010) + 1
17. (660 × 31) + (660 × 69)
18. 18 + 5 + 42 + 95
19. (326 × 75) + (326 × 15) + (326 × 10)
20. (22,222 × 11) + (22,222 × 6) + (22,222 × 3)

1	8	6	3	2	5	6	7	1	9	9	1
6	5	5	6	4	2	1	4	3	0	7	1
3	2	0	0	0	9	7	4	4	6	5	1
5	4	3	2	3	5	7	4	2	3	0	1
9	8	1	5	3	3	6	4	7	2	6	1
8	4	3	7	9	5	6	4	3	6	7	1
1	7	5	7	8	0	0	0	5	0	3	2
0	7	5	4	0	7	0	4	6	0	0	8
0	3	7	7	9	8	0	1	2	3	5	4
3	6	1	8	9	7	6	5	2	9	9	1
8	7	6	3	3	0	2	3	4	1	0	9
8	9	0	0	6	2	0	0	6	1	0	4

Making Practice Fun 6 Name_____

The Distributive Law—Factoring, Evaluating Expressions

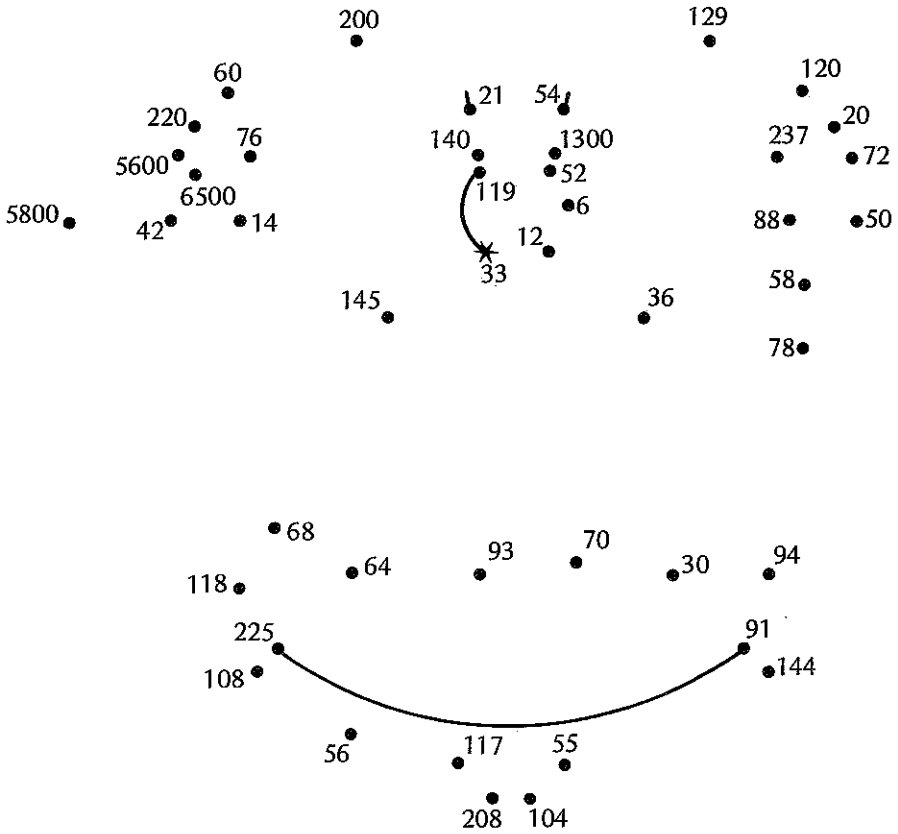
DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Factor each expression. Evaluate the factored expression for $a = 3$, $b = 5$, $c = 8$, $p = 1$, $q = 2$, and $w = 0$. Check by evaluating the original expression.

1. $3a + 3c = 3(a + c) = 33$
2. $5b + 15c$
3. $8b + 8a$
4. $75q + 75p$
5. $36p + 36q$
6. $7a + 7b$
7. $9c + 9b$
8. $16c + 16b$
9. $13a + 13b$
10. $5c + 5a$
11. $18a + 18b$
12. $7b + 7c$
13. $10p + 10q$
14. $12q + 12p$
15. $12p + 12w$
16. $2q + 2p$
17. $4b + 4c$
18. $100c + 100b$
19. $79q + 79p$
20. $11a + 11b$
21. $5c + 5q$
22. $9w + 9c$
23. $4a + 4q$
24. $15a + 15b$
25. $12q + 12a$
26. $55p + 55a$
27. $700b + 700a$
28. $14w + 14a$
29. $7q + 7w$
30. $19a + 19p$
31. $35a + 35p$
32. $17b + 17q$
33. $9p + 9b$
34. $13a + 13p$
35. $3b + 3q$



Making Practice Fun 7 Name_____

Using the Distributive Law—Factoring, Multiplying, Collecting Like Terms

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

Factor.

1. $3x + 12 = 3(x + 4)$
2. $5x + 15$
3. $24 + 8x$
4. $9x + 27y$
5. $3y + 21$
6. $24x + 42y$
7. $8x + 28$
8. $100 + 30x$
9. $18x + 60y$
10. $14x + 21w$
11. $11a + 55c$
12. $24a + 36c$
13. $9 + 18a + 36c$
14. $10 + 15w + 25x$
15. $21 + 14R + 35T$
16. $8x + 24y + 72w$
17. $4x + 16w + 64$
18. $7m + 14p + 21k$

Multiply.

19. $2(x + 3)$
20. $3(x + 7)$
21. $7(2x + 5)$
22. $6(3x + 4)$
23. $3(2t + 5)$
24. $8(5t + 7m)$
25. $2(9m + 8)$
26. $3(2x + 5y)$
27. $3(4x + 2y + w)$
28. $5(8x + y + 8w)$
29. $7(7m + 7)$
30. $3(x + 10)$
31. $2(2x + 12y + 3w)$
32. $4(3x + 7y + 5)$
33. $6(9x + 2y + 1)$
34. $8(5x + 2y + 1)$

Collect like terms.

35. $3x + 8x$
36. $7y + 13y$
37. $x + 11x$
38. $2a + 5c + 3a$
39. $4x + 9y + 7x$
40. $x + 3y + 4x$
41. $7x + 8y + 2x + 3y$
42. $4a + 3b + b$

C $3(x-4)$	**L** $3(x+4)$	**A** $7(m+2p+3k)$	**S** $5(2+3w+5x)$	**S** $6(4x+7y)$	**F** $5x+3y$	**U** $8(3+x)$	**N** $12x$
P $14x+35$	**L** $40x+5y+8w$	**E** $12x+6y+3w$	**A** $12(2a+3c)$	**S** $20y$	**A** $6t+15$	**V** $40x+5y+40w$	**E** $3x+21$
M $9(1+2a+4c)$	**T** $6(3x+10y)$	**E** $9(2a+4c)$	**N** $4(2x+7)$	**I** $2x+6$	**C** $5(x+3)$	**E** $10(10+3x)$	**O** $4(x+4w+16)$
A $9(x+3y)$	**O** $3x+30$	**L** $8(x+3y+9w)$	**V** $7(21+2R+5T)$	**S** $40t+56m$	**T** $7(3+2R+5T)$	**O** $5a+5c$	**P** $18m+16$
T $9x+11y$	**A** $6x+15y$	**L** $4x+24y+6w$	**G** $18x+24$	**E** $4a+b$	**R** $7(2x+3w)$	**R** $4a+4b$	**A** $11x$
H $12x+28y+20$	**A** $11(a+5c)$	**S** $54x+12y+6$	**M** $3(y+7)$	**O** $49m+49$	**R** $49m+7$	**E** $11x+9y$	**Y** $40x+16y+8$

Making Practice Fun 8 Name _____

Dividing by Multiplying by a Reciprocal

MESSAGE IN CODE

1. Work each exercise and simplify the answer.
2. Find the code letter for that answer.
3. Write the code letter in the blank by the exercise number. You may use the same code letter several times.

Exercises

W 1. $\frac{2}{3} \div \frac{4}{9} = 1\frac{1}{2}$

2. $\frac{4}{5} \div \frac{7}{8}$

3. $\frac{1}{2} \div \frac{1}{5}$

4. $\frac{5}{7} \div \frac{3}{14}$

5. $\frac{5}{8} \div \frac{3}{4}$

6. $\frac{1}{2} \div \frac{7}{10}$

7. $\frac{24}{13} \div \frac{48}{26}$

8. $\frac{9}{2} \div \frac{27}{20}$

9. $\frac{1}{10} \div \frac{9}{5}$

10. $\frac{3}{4} \div \frac{9}{28}$

11. $\frac{2}{7} \div \frac{8}{35}$

12. $\frac{13}{4} \div \frac{3}{4}$

13. $7 \div \frac{1}{\frac{1}{7}}$

14. $18 \div \frac{45}{11}$

15. $\frac{1}{3} \div \frac{1}{7}$

16. $3 \div \frac{18}{5}$

17. $\frac{2}{3} \div 5$

18. $\frac{5}{4} \div \frac{1}{2}$

19. $\frac{7}{8} \div \frac{7}{8}$

20. $\frac{3}{7} \div \frac{3}{5}$

21. $20 \div \frac{6}{1}$

22. $\frac{14}{15} \div \frac{42}{45}$

23. $\frac{8}{15} \div 4$

24. $\frac{15}{16} \div \frac{3}{8}$

? 25. $14 \div \frac{28}{3}$

26. $16 \div \frac{35}{2}$

27. $\frac{3}{2} \div \frac{3}{5}$

28. $15 \div \frac{9}{2}$

29. $\frac{14}{6} \div \frac{2}{3}$

30. $24 \div \frac{105}{4}$

31. $40 \div 16$

32. $\frac{3}{5} \div \frac{3}{20}$

33. $\frac{2}{5} \div \frac{3}{10}$

34. $\frac{5}{6} \div 15$

35. $\frac{2}{7} \div \frac{4}{49}$

36. $\frac{14}{15} \div \frac{49}{48}$

37. $\frac{8}{7} \div \frac{5}{4}$

38. $4 \div \frac{12}{3}$

39. $\frac{2}{9} \div \frac{1}{2}$

40. $\frac{17}{15} \div \frac{34}{75}$

41. $\frac{2}{7} \div \frac{4}{14}$

42. $\frac{11}{13} \div \frac{5}{26}$

43. $\frac{5}{6} \div \frac{15}{18}$

44. $\frac{21}{8} \div \frac{3}{4}$

45. $\frac{3}{5} \div \frac{6}{35}$

46. $\frac{3}{2} \div \frac{9}{14}$

47. $3 \div \frac{6}{5}$

Code Letter	Simplified Answer
A	1
B	$1\frac{1}{3}$
C	$4\frac{1}{3}$
D	$1\frac{1}{4}$
E	$2\frac{1}{2}$
F	$4\frac{1}{2}$
G	$2\frac{1}{4}$
H	$\frac{32}{35}$
I	$\frac{5}{6}$
J	$1\frac{3}{32}$
K	$\frac{2}{15}$
L	$2\frac{1}{3}$
M	$1\frac{1}{5}$
N	$3\frac{1}{3}$
O	$\frac{1}{18}$
P	18
Q	$\frac{1}{36}$
R	$4\frac{2}{5}$
S	$\frac{5}{7}$
T	$3\frac{1}{2}$
U	$8\frac{1}{3}$
V	$\frac{4}{9}$
W	$1\frac{1}{2}$
X	$\frac{3}{10}$
Y	4
Z	$\frac{3}{25}$

Making Practice Fun 9 Name_____

Using the Proper Symbol >, <, or = Between Two Fractional Numerals

HIDDEN MESSAGE

1. Check each equation and inequality.
2. Shade the incorrect equations and incorrect inequalities.
3. Read the message in the unshaded blocks.

T $\frac{1}{2} < \frac{1}{3}$	H $\frac{13}{15} > \frac{9}{10}$	E $\frac{5}{4} < \frac{8}{7}$	R $\frac{12}{13} = \frac{48}{42}$	E $\frac{7}{11} > \frac{4}{5}$	I $\frac{17}{15} > \frac{10}{3}$	S $\frac{1}{3} > \frac{3}{5}$	A $\frac{2}{7} > \frac{1}{4}$
W $\frac{17}{13} > \frac{4}{3}$	A $\frac{11}{8} > \frac{7}{5}$	S $\frac{12}{11} < \frac{6}{5}$	Y $\frac{3}{8} > \frac{2}{5}$	I $\frac{5}{8} < \frac{7}{11}$	G $\frac{2}{9} < \frac{1}{4}$	N $\frac{3}{7} < \frac{2}{5}$	N $\frac{1}{6} > \frac{2}{13}$
P $\frac{5}{11} > \frac{9}{16}$	L $\frac{5}{60} = \frac{1}{14}$	A $\frac{11}{14} < \frac{3}{4}$	N $\frac{2}{9} > \frac{1}{4}$	T $\frac{8}{15} = \frac{15}{30}$	L $\frac{17}{6} > \frac{20}{7}$	O $\frac{19}{10} < \frac{15}{8}$	F $\frac{17}{20} < \frac{11}{13}$
F $\frac{6}{25} > \frac{4}{11}$	O $\frac{10}{9} > \frac{11}{12}$	R $\frac{4}{5} < \frac{3}{4}$	E $\frac{18}{24} > \frac{16}{18}$	V $\frac{4}{13} > \frac{7}{15}$	F $\frac{11}{20} > \frac{3}{6}$	R $\frac{3}{8} = \frac{9}{27}$	Y $\frac{11}{40} = \frac{5}{20}$
O $\frac{3}{10} < \frac{7}{25}$	F $\frac{5}{8} > \frac{8}{12}$	T $\frac{7}{15} < \frac{2}{15}$	E $\frac{30}{8} = \frac{15}{16}$	N $\frac{15}{11} > \frac{12}{8}$	Y $\frac{9}{7} > \frac{8}{6}$	O $\frac{6}{10} < \frac{3}{5}$	U $\frac{3}{16} > \frac{5}{26}$
G $\frac{14}{15} = \frac{28}{30}$	O $\frac{15}{19} < \frac{2}{3}$	E $\frac{13}{4} < \frac{11}{3}$	N $\frac{7}{15} > \frac{4}{9}$	I $\frac{36}{84} = \frac{3}{7}$	S $\frac{51}{7} < \frac{11}{2}$	U $\frac{32}{45} < \frac{4}{5}$	S $\frac{3}{20} < \frac{5}{33}$
M $\frac{17}{13} > \frac{3}{2}$	A $\frac{5}{6} < \frac{4}{7}$	T $\frac{12}{9} = \frac{28}{27}$	H $\frac{100}{201} = \frac{10}{21}$	W $\frac{1}{2} = \frac{202}{101}$	E $\frac{7}{8} > \frac{9}{10}$	D $\frac{11}{5} > \frac{14}{6}$	O $\frac{5}{14} > \frac{4}{11}$

Making Practice Fun 10 Name _____

Solving Equations by Trial and Writing Related Sentences

SECRET MESSAGE

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Find a related sentence for each equation.

1. $18 - 11 = 7$
   $18 = 7 + 11$ A
2. $x = 9 + 14$
3. $\frac{x}{2} = 7$
4. $\frac{3}{4}x = 18$
5. $26 + 14 = 40$

Solve by trial.

6. $x + 9 = 20$
7. $x - 7 = 13$
8. $3x = 27$
9. $4y = 100$
10. $3y - 4 = 32$
11. $2y + 3 = 5$
12. $14y - 1 = 27$
13. $3y - 6 = 45$
14. $2x + 9 = 93$
15. $3x = 45$
16. $4x + 22 = 50$
17. $12x - 6 = 30$
18. $6x = 24$
19. $x - 9 = 4$
20. $x - 4 = 9$
21. $2x - 100 = -16$
22. $x - 19 = -16$
23. $2x + 29 = 47$
24. $4x - 8 = 60$
25. $3x - 27 = -15$
26. $15x = 165$
27. $7x - 8 = 97$
28. $7x + 149 = 156$

Code Letter	Answer
A	$18 = 7 + 11$
B	12
C	$x + 9 = 14$
D	2
E	9
F	$26 - 40 = 14$
G	5
H	3
I	13
J	8
K	$x - 9 = 14$
L	11
M	4
N	20
O	17
P	$26 = 40 - 14$
Q	45
R	42
S	25
T	15
U	7
V	$x = 2 \cdot 7$
W	$x = 18 \cdot \frac{4}{3}$
X	35
Y	1
Z	$x = 18 \cdot \frac{3}{4}$

Knock knock! Who's there?

2	8	7	15	.	2	8	7	15		4	17	13	?	2	8	7	15						
11	24	16			9	23	23			20	25			10	16	9	11	?					

Knock knock! Who's there?

9	15	A 1	7	.	9	27	A 1	7		4	17	13	?	9	15	A 1	7						
10	28				4	17	19	6	8	20				9	13	26	3	8					
27	17	8	9	23		5	14	24	10	6	8	18	9	.									

Knock knock! Who's there?

5	17	19	6	.	5	17	19	6		4	17	13	?	5	22	20	26						
28	13	16	21		17	8	A 1	14	15	4	20	15	17										
6	13	3	23		A 1	7	12		11	24	16	21		18	19	7	12						
4	19	15	17		25	A 1	27	17	!														

Making Practice Fun 11 Name _____

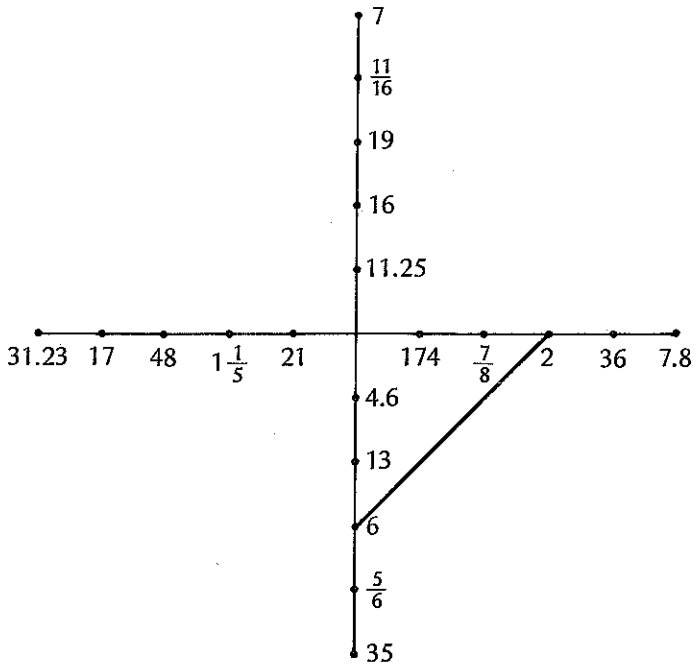
Solving Equations by Using Related Sentences

DIAGRAM PUZZLE

1. Work Exercise A1 and Exercise B1.
2. Draw a straight line segment connecting these two answers.
3. Continue with Exercise A2 and Exercise B2, and so on.

Exercises A

1. $x + 8 = 10 \quad x = 2$
2. $27 - x = 11$
3. $x - 5 = 8$
4. $x + 34 = 55$
5. $x - 89 = 85$
6. $3x = 105$
7. $5x = 240$
8. $4(x + 3) = 76$
9. $7(x + 2) = 105$
10. $180 = 2(x - 84)$
11. $10(x + 32) = 380$
12. $5x = 6$
13. $100y = 3123$
14. $5x = 23$
15. $3.4y = 38.25$
16. $\frac{3}{8} = x - \frac{5}{16}$
17. $\frac{3}{5}x = \frac{18}{25}$
18. $x + 18.77 = 50$
19. $\frac{\frac{x}{2}}{3} = \frac{21}{16}$
20. $\frac{x}{0.25} = 8$



Exercises B

1. $x + 9 = 15 \quad x = 6$
2. $32 - x = 15$
3. $y - 17 = 19$
4. $37 + y = 44$
5. $y - 7 = 0$
6. $4y = 84$
7. $2y = 38$
8. $2(x + 4) = 80$
9. $3(x + 3) = 60$
10. $3(x - 22) = 39$
11. $4(x - 37) = 44$
12. $16x = 11$
13. $4x = 45$
14. $1.2y = 9.36$
15. $2.5x = 19.5$
16. $x + \frac{1}{4} = \frac{9}{8}$
17. $\frac{5}{4}x = \frac{25}{24}$
18. $x - 2.18 = 2.42$
19. $\frac{\frac{x}{1}}{3} = \frac{5}{2}$
20. $\frac{39.9}{x} = 2.1$

Making Practice Fun 12 Name _____

Solving Problems by Translating to Equations and Solving

HIDDEN MESSAGE

1. Use equations to solve each problem.
2. Shade in the sector that contains the answer.
3. Read the message in the unshaded sectors.

Exercises

1. Fifteen is three-fifths of what number? 25

2. Sixty-eight is one-fourth of what number?

3. Eighty-four is three-fourths of what number?

4. Thirty-four is what number plus eighteen?

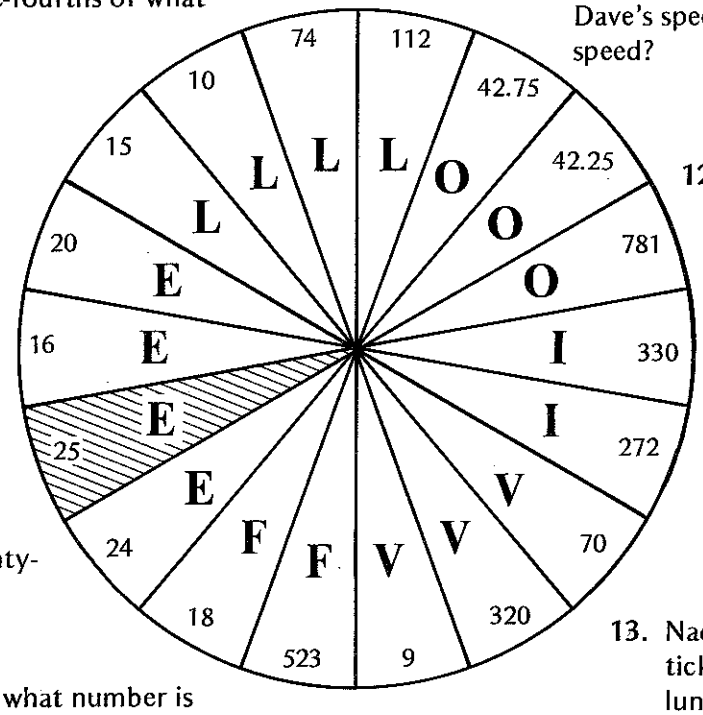
5. Seven hundred five is what number plus one hundred eighty-two?

6. Forty-seven is what number minus twenty-three?

7. Eighty-seven minus what number is thirteen?

8. Three hundred twenty-five is what number minus four hundred fifty-six?

9. Twice some number is eight more than twelve. What is the number?



10. Three times some number is eleven more than forty-nine. What is the number?

11. Ed can paint a one-story house in twelve hours. This is two-thirds of Dave's speed. What is Dave's speed?

12. A new machine can produce 5000 bolts in two-thirds the time required by the old machine. If it takes the new machine six hours to do this job, how long did it take the old machine?

13. Nadine spent $18.50 for tickets, and $16.75 for lunch. She still had $7.50 left. How much did she have to begin with?

14. The speed of sound in hydrogen is about 3.9 times its speed in air. If its speed in hydrogen is almost 1287 m/s what is its speed in air?

Making Practice Fun 13 Name _____

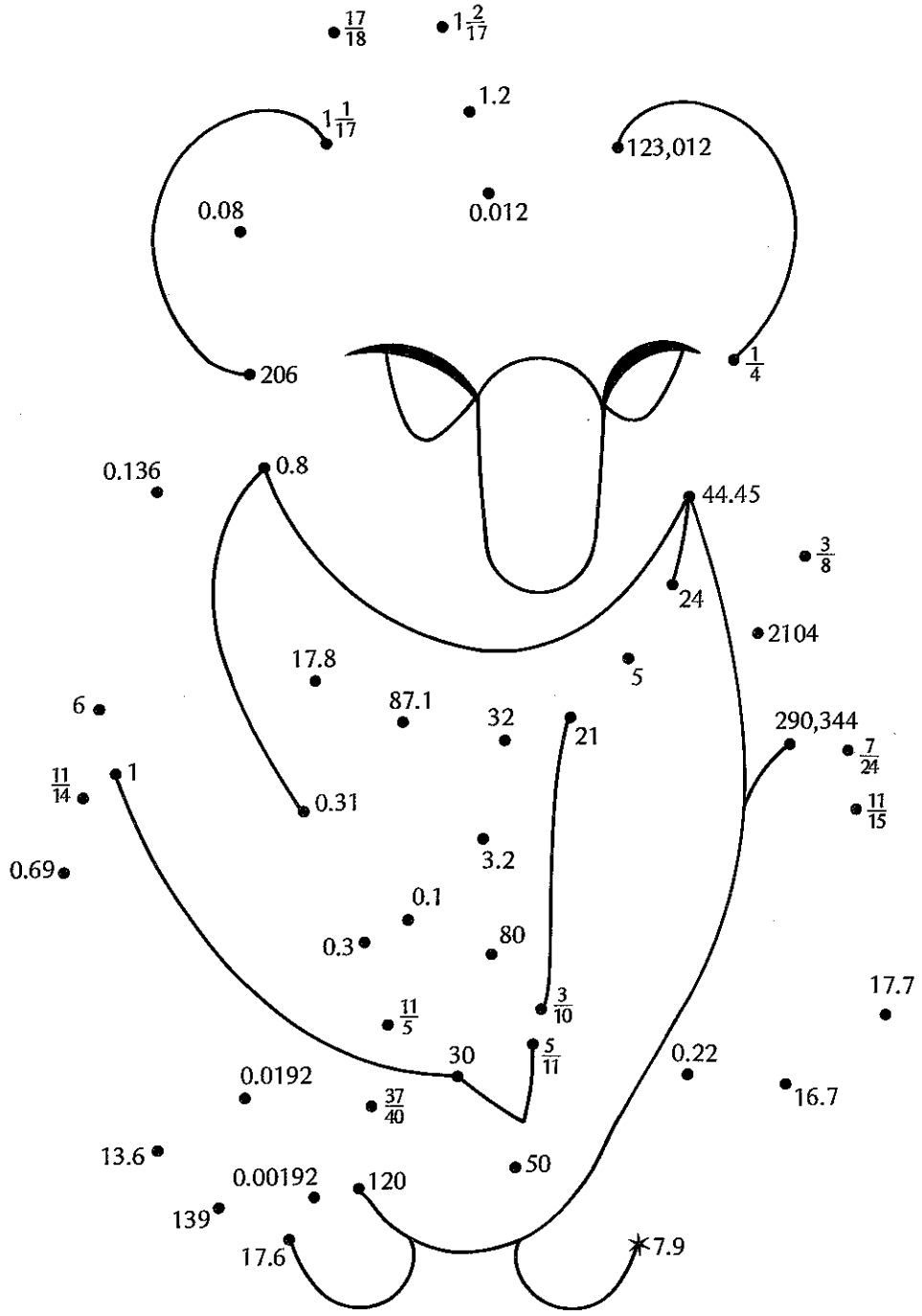
Real Numbers—Adding, Subtracting, Multiplying, Dividing

DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

1. $0.06 + 7.84 = 7.9$
2. $21 - 4.3$
3. $\frac{1}{3} + \frac{2}{5}$
4. $\frac{5}{8} - \frac{1}{3}$
5. $286{,}136 + 4208$
6. $5001 - 2897$
7. 12.7×3.5
8. $\frac{7}{8} \times \frac{4}{14}$
9. 402×306
10. $2.916 \div 2.43$
11. $\frac{15}{17} \div \frac{5}{6}$
12. $8446 \div 41$
13. $3.68 \div 4.6$
14. 0.03×200
15. $\frac{7}{8} \times \frac{16}{14}$
16. $\frac{3}{14} \times \frac{11}{3}$
17. $0.9 - 0.21$
18. $8 + 4.7 + 0.9$
19. $47 + 9 + 83$
20. 2.75×6.4
21. 0.0064×0.3
22. $14.4 \div 0.12$
23. $\frac{3}{8} + \frac{1}{5} + \frac{7}{20}$
24. $16\frac{2}{3} \times 1\frac{4}{5}$
25. $\frac{35}{44} \div \frac{7}{4}$
26. $\frac{1}{2} - \frac{3}{15}$
27. $48.15 + 31.85$
28. $70 \div 700$
29. $0.9 - 0.6$
30. $15.5 \div 50$
31. $99 - 11.9$
32. $\frac{14.88}{4.65}$
33. $\sqrt{81} + \sqrt{144}$
34. $\sqrt{100} - \sqrt{25}$
35. $\sqrt{121} + \sqrt{169}$



Making Practice Fun 14 Name _____

Integers and Rational Numbers—Absolute Value

MESSAGE IN CODE

1. Work each exercise.
2. Find the code letter for that answer.
3. Write the code letter in the blank by the exercise number. You may use the same code letter several times.

What happened when the giraffe stepped on the grape?

Exercises

Find the absolute value of each integer.

T 1. −7
_____ 2. 13
_____ 3. −5
_____ 4. 0
_____ 5. −9
_____ 6. 6
_____ 7. −27
_____ 8. 5
_____ 9. −100
_____ 10. −6
_____ 11. 200

Simplify.

_____ 12. |−42|
_____ 13. |9|
_____ 14. |−50|
_____ 15. |−200|
_____ 16. |−7| + |−6|
_____ 17. |−2| + |−3|
_____ 18. |−19| + |1|
_____ 19. |−4| + |2|
_____ 20. |−10|
_____ 21. |−10| + |−10|
_____ 22. |−15|
_____ 23. |1| + |−4|
_____ 24. |−2| + |5|
_____ 25. |−8| + |8|
_____ 26. |−11| + |39|
_____ 27. |−1| + |−4| + 2
_____ 28. |6|
_____ 29. |−13| + |2|
_____ 30. |−75|
_____ 31. |−4| + |−3|
_____ 32. |4| + |3|
_____ 33. |−1| + |−14|
_____ 34. |−1| + |4|
_____ 35. |−75| + |25|
_____ 36. |30| + |40| + |−5|
_____ 37. |−8| + |2|
_____ 38. |−5| + |0|

Code Letter	Answer
A	6
B	−13
C	42
D	20
E	5
F	−6
G	0
H	13
I	75
J	−5
K	8
L	15
M	11
N	10
O	16
P	27
Q	−50
R	9
S	200
T	7
U	50
W	100
Y	3

Making Practice Fun 15 Name_____

Additive Inverses, Adding Positive and Negative Integers

DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Find the additive inverse of each integer.

1. −8 8
2. 13
3. 0
4. −57
5. 102
6. −1
7. 1
8. −18
9. 200
10. −5
11. 19
12. −16
13. −41
14. −67
15. 1000
16. −500

Add.

17. 8 + (−20)
18. −13 + 5
19. 27 + (−8)
20. 16 + (−21)
21. −26 + 100
22. 26 + (−100)
23. 0 + (−11)
24. −28 + 0
25. −72 + 74
26. 84 + (−64)
27. −9 + 0
28. −19 + 4
29. −70 + 13
30. −14 + 70
31. −716 + 284

32. −213 + 445
33. 625 + (−516)
34. −10 + (−15) + (−37) + (−18)
35. −36 + (−24) + (−19) + (−11)
36. 27 + (−43) + (−52) + 36
37. −82 + (−46) + 23 + 17
38. −213 + (−415) + 880 + (−160)
39. −216 + (−414) + 109 + (−354)

40.
845
−373
216
−701

41.
−11
−15
−17
29

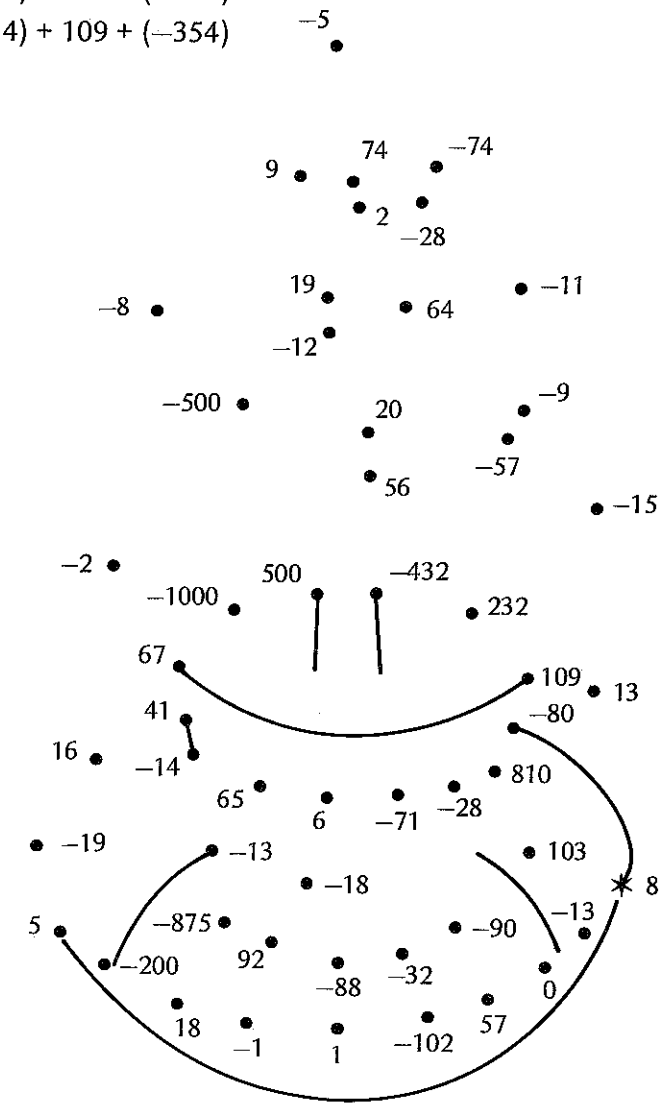
42.
−82
75
−14
86

43.
−98
71
−55
88

44.
−213
−312
−106
43
517

45.
−28
−28
−28
28
28

46.
1002
758
−436
−514



Making Practice Fun 16 Name_____

Integers and Rational Numbers—Adding, Subtracting

FACTS ABOUT REPTILES

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Add or subtract.

1. $-8.8 + 4.9 = -3.9$ **B**
2. $-3.7 + (-4.3)$
3. $-\frac{3}{5} + (-\frac{1}{5})$
4. $4 - (-11)$
5. $-8.3 - (-2.4)$
6. $-\frac{7}{15} + \frac{2}{5}$
7. $-\frac{2}{3} + \frac{4}{5}$
8. $\frac{3}{8} - \frac{7}{20}$
9. $17.36 - (-23.15)$
10. $0 - (-0.8)$
11. $1.3 - (7.9)$
12. $-3.84 + (-6.11)$
13. $-\frac{4}{7} + \frac{13}{14}$
14. $\frac{1}{6} - (-\frac{1}{3})$
15. $-98.1 + 100$
16. $-63.5 + (-36.5)$
17. $43.1 - (-56.9)$
18. $\frac{4}{5} - (\frac{9}{10})$
19. $-0.6 + (-0.4)$

Code Letter	Answer
A	$-\frac{1}{15}$
B	-3.9
C	$\frac{1}{40}$
D	$-\frac{1}{10}$
E	1.9
F	$-\frac{2}{5}$
G	-1
H	-5.9
I	15
J	-10.7
K	$\frac{5}{14}$
L	-8
M	-9.95
N	40.51
O	100
P	0.8
R	$\frac{2}{15}$
S	$-\frac{4}{5}$
T	$\frac{1}{2}$
U	-6.6
W	6.4
Y	-100

This colorful lizard is found mainly in the Tropics:

B
1 6 9 18 15 18 19 15 8 13 17

This reptile is the largest living lizard:

13 17 12 17 18 17 18 7 6 19 17 9

This extinct flying reptile had a 51-foot wing span:

10 14 15 7 17 3 6 11 7

The black and white markings on the back of this snake make a clown's face:

4 9 18 4 6 9 8 17 B 1 7 6

This reptile is the largest snake ever accurately measured:

6 3 4 6 9 7 15 14 4 8 11 2 6 14 15 10 16 14 5 17 9

The snake above measured:

14 15 9 12 15 14 15 7 3

Making Practice Fun 17 Name_____

Integers and Rational Numbers—Multiplying

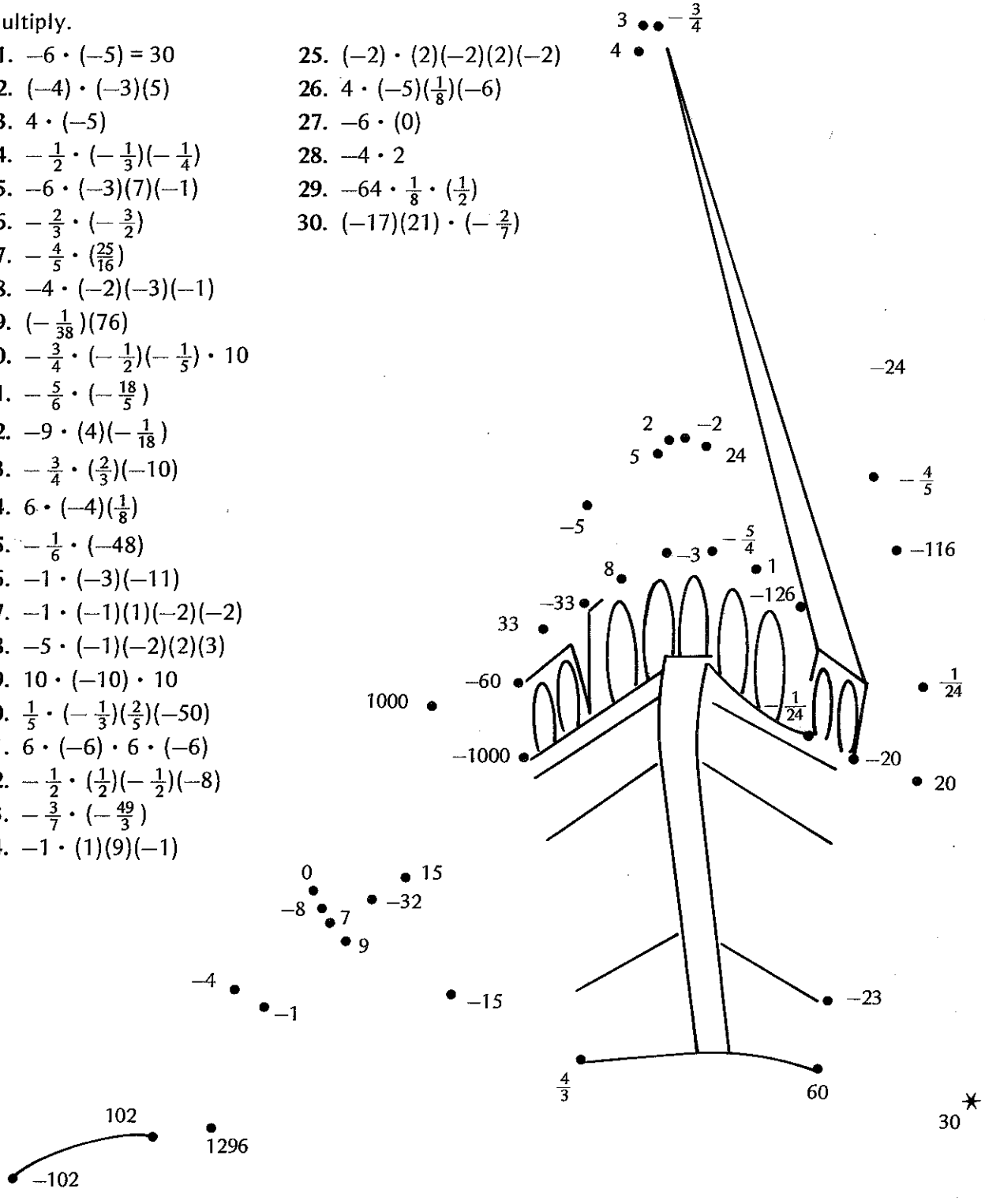
DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Multiply.

1. $-6 \cdot (-5) = 30$
2. $(-4) \cdot (-3)(5)$
3. $4 \cdot (-5)$
4. $-\frac{1}{2} \cdot (-\frac{1}{3})(-\frac{1}{4})$
5. $-6 \cdot (-3)(7)(-1)$
6. $-\frac{2}{3} \cdot (-\frac{3}{2})$
7. $-\frac{4}{5} \cdot (\frac{25}{16})$
8. $-4 \cdot (-2)(-3)(-1)$
9. $(-\frac{1}{38})(76)$
10. $-\frac{3}{4} \cdot (-\frac{1}{2})(-\frac{1}{5}) \cdot 10$
11. $-\frac{5}{6} \cdot (-\frac{18}{5})$
12. $-9 \cdot (4)(-\frac{1}{18})$
13. $-\frac{3}{4} \cdot (\frac{2}{3})(-10)$
14. $6 \cdot (-4)(\frac{1}{8})$
15. $-\frac{1}{6} \cdot (-48)$
16. $-1 \cdot (-3)(-11)$
17. $-1 \cdot (-1)(1)(-2)(-2)$
18. $-5 \cdot (-1)(-2)(2)(3)$
19. $10 \cdot (-10) \cdot 10$
20. $\frac{1}{5} \cdot (-\frac{1}{3})(\frac{2}{5})(-50)$
21. $6 \cdot (-6) \cdot 6 \cdot (-6)$
22. $-\frac{1}{2} \cdot (\frac{1}{2})(-\frac{1}{2})(-8)$
23. $-\frac{3}{7} \cdot (-\frac{49}{3})$
24. $-1 \cdot (1)(9)(-1)$
25. $(-2) \cdot (2)(-2)(2)(-2)$
26. $4 \cdot (-5)(\frac{1}{8})(-6)$
27. $-6 \cdot (0)$
28. $-4 \cdot 2$
29. $-64 \cdot \frac{1}{8} \cdot (\frac{1}{2})$
30. $(-17)(21) \cdot (-\frac{2}{7})$



Making Practice Fun 18 Name_____

Integers and Rational Numbers—Dividing

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

Divide by multiplying by the reciprocal.

1. $-\frac{3}{4} \div \frac{2}{5} = -1\frac{7}{8}$
2. $-\frac{5}{8} \div \frac{5}{16}$
3. $-\frac{2}{7} \div (-\frac{10}{21})$
4. $\frac{7}{8} \div \frac{1}{4}$
5. $-\frac{11}{13} \div \frac{33}{26}$
6. $-\frac{1}{2} \div (-\frac{1}{5})$
7. $-\frac{3}{7} \div \frac{15}{14}$
8. $-\frac{1}{8} \div 4$
9. $-\frac{10}{11} \div (-\frac{1}{2})$
10. $-25 \div \frac{1}{3}$
11. $-\frac{1}{3} \div (-25)$
12. $-75 \div \frac{25}{27}$
13. $-\frac{2}{5} \div \frac{2}{5}$
14. $-6 \div (-\frac{2}{3})$
15. $-\frac{3}{7} \div 7$
16. $-24 \div \frac{3}{8}$
17. $\frac{4}{5} \div 8$
18. $\frac{3}{4} \div (-6)$
19. $-\frac{7}{10} \div (-14)$
20. $-\frac{16}{49} \div \frac{8}{7}$
21. $36 \div (-\frac{1}{2})$
22. $-2 \div (-\frac{1}{2})$
23. $(-\frac{1}{2}) \div 2$
24. $-\frac{11}{12} \div (-\frac{1}{6})$
25. $0 \div \frac{3}{4}$

M $-\frac{3}{5}$	**A** $\frac{1}{75}$	**T** -72	**H** $5\frac{1}{2}$	**S** -2	**F** $-\frac{2}{3}$	**M** $\frac{1}{20}$	**V** $1\frac{9}{11}$
A $\frac{1}{10}$	**A** 1	**S** 9	**O** $-1\frac{7}{8}$	**L** -64	**V** -1	**A** -75	**E** $-\frac{1}{4}$
T $-\frac{1}{32}$	**W** $3\frac{1}{2}$	**T** $\frac{7}{32}$	**S** 4	**T** 0	**U** $-\frac{2}{5}$	**D** $-\frac{2}{7}$	**Y** $\frac{3}{5}$
H $-\frac{1}{8}$	**W** $\frac{2}{7}$	**H** $-\frac{3}{49}$	**H** $\frac{3}{49}$	**A** $2\frac{1}{2}$	**I** $3\frac{1}{3}$	**T** -81	**Z** -4

Making Practice Fun 19

Name_____

Using the Distributive Law—Factoring, Multiplying, Collecting Like Terms

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

Factor.

1. $3x + 27 = 3(x + 9)$
2. $5y - 35$
3. $6x + 54$
4. $6x + 9y - 15$
5. $ax - ay + aw$
6. $36 - 27k$
7. $mx + my - mt$
8. $28 - 14y + 35w$
9. $9x - 15y - 6$

Multiply.

10. $3(x + 4)$
11. $5(x - 3)$
12. $-7(x + 8)$
13. $-2(x - 6)$
14. $5(x + y)$
15. $-4(11 - 3y)$
16. $9(2 + 7y)$
17. $a(x - 4y)$
18. $c(x + 3y + 2w)$
19. $-3(c + ce)$
20. $k(m - 5t)$
21. $-7(-3x - 2y - 9w)$

Collect like terms.

22. $32y - 15y$
23. $7w + w$
24. $9x - x$
25. $x - 20x$
26. $16a - 5e + a - e$
27. $3.1x - 2.4y + 6.9x - 7.6y$
28. $2.8x - 7.1y - 8x + 0.2y$
29. $\frac{5}{10}x + \frac{3}{10}y - \frac{7}{10}x + \frac{1}{10}y$

O $3(x + 9)$	**Y** $cx + 3cy + 2cw$	**O** $10x - 10y$	**U** $3(2x + 3y - 5)$	**S** $-19x$	**E** $5x - 15$	**E** $6(x + 9)$
K $8w$	**N** $m(x + y - t)$	**O** $km - 5kt$	**W** $19x$	**H** $-44 + 12y$	**O** $17a - 6e$	**W** $-5.2x - 6.9y$
O $-7x - 56$	**D** $21x + 14y + 63w$	**O** $4(2x - 7)$	**N** $9(4 - 3k)$	**I** $cx - 3cy - 2cw$	**C** $3x + 12$	**E** $17y$
A $3(3x - 5y - 2)$	**H** $-5.2x - 5.9y$	**T** $5x + 5y$	**H** $5(y - 7)$	**E** $ax - 4ay$	**S** $-48a + 28c$	**E** $7(4 - 2y + 5w)$
O $18 + 63y$	**W** $8x$	**O** $-2x + 12$	**R** $a(x - y + w)$	**K** $-3c - 3ce$	**M** $-\frac{1}{5}x + \frac{2}{5}y$	**E** $\frac{3}{7}x + \frac{2}{7}y$

Making Practice Fun 20 Name_____

Integers and Rational Numbers—Removing Parentheses and Simplifying

FACTS ABOUT DOGS

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Remove parentheses and simplify.

1. $7x - (3x + 8) = 4x - 8$ K
2. $10x + (7x + 5)$
3. $2a + 4c - (a - 2c)$
4. $5a - 2c + 7 - (6a - 3c + 2)$
5. $a - b - (a + b)$
6. $7a - 3c - 4x - (5a - 8c - 2x)$
7. $2 \cdot [5 + 6(8 - 3)]$
8. $3 \cdot [4 - 3(7 - 1)]$
9. $[7(8 - 2) + 9] - [13 - 2(11 - 6) + 1]$
10. $[13 - 2(7 - 4) - 8] - [5 + 6(12 - 5) - 38]$
11. $[5(2x + 3) - 6] + [6 - 3(3x - 1) - 8]$
12. $3[5x - 4] - [-30 - 45x]$
13. $2 \cdot [15 + 2(9 - 2)] - 3 \cdot [17 - 4(8 - 5)]$
14. $3\{[9(x - 2) + 7] - 2[4(x + 5) - 36]\}$
15. $4[24 - 3(7x + 6)] - 6(4 - 14x)$
16. $-53 - 2[7 - 6(5 + 11)] - (2 - 3) - 4$
17. $6(9x + 3) + 6x$
18. $2[100 - 80] - [100 - 2(50 - 60)]$
19. $4 - [3x - 6y] - 2[4x + 5y]$
20. $7 - 5[5 - (3 - 1)]$
21. $8x - 4[2x - 5(3x + 1)] - 2[x - (x - 1)]$

Code Letter	Answer
A	$60x + 18$
B	$2a + 5c - 2x$
C	43
D	-80
E	$x + 10$
F	70
G	0
H	$4 - 11x - 4y$
I	-42
J	10
K	$4x - 8$
L	$17x + 5$
M	$a + 6c$
N	122
O	47
P	$4x + 8$
Q	$2a + 5c - x$
R	-10
S	$-2b$
T	$-a + c + 5$
U	-8
V	$2b$
W	$3x + 63$
X	80
Y	$60x - 18$
Z	42

This dog is one of the oldest of the Greyhound breeds:

$\overline{17}\ \overline{7}\ \overline{15}\ \overline{19}\ \overline{17}\ \overline{16}\quad\overline{19}\ \overline{9}\ \overline{20}\ \overline{16}\ \overline{18}$

This is the smallest dog:

$\overline{13}\ \overline{19}\ \overline{8}\ \overline{19}\ \overline{20}\ \overline{12}\ \overline{19}\ \overline{20}\ \overline{12}$

This dog is one of the largest breeds:

$\overline{15}\ \overline{10}\ \overline{11}\ \overline{12}\ \overline{4}\quad\overline{18}\ \overline{21}\ \overline{16}\ \overline{11}$

This massive dog used to protect flocks from wolves:

$\overline{\underset{1}{\underset{\text{K}}{}}}\ \overline{21}\ \overline{10}\ \overline{21}\ \overline{6}\ \overline{21}\ \overline{5}\ \overline{19}$

This is one of the fastest dogs:

$\overline{5}\ \overline{21}\ \overline{2}\ \overline{20}\ \overline{\underset{1}{\underset{\text{K}}{}}}\ \overline{8}$

This hunting dog is nicknamed "ghost dog":

$\overline{14}\ \overline{11}\ \overline{8}\ \overline{3}\ \overline{17}\ \overline{10}\ \overline{17}\ \overline{16}\ \overline{11}\ \overline{10}$

This dog was bred to tackle badgers:

$\overline{15}\ \overline{2}\ \overline{11}\ \overline{16}\quad\overline{9}\ \overline{7}\quad\overline{8}\ \overline{3}\ \overline{21}\ \overline{21}\ \overline{2}\quad\overline{4}\ \overline{11}\ \overline{10}\ \overline{10}\ \overline{8}\ \overline{11}\ \overline{10}$

This is a black Belgian sheep dog:

$\overline{15}\ \overline{10}\ \overline{9}\ \overline{11}\ \overline{16}\ \overline{11}\ \overline{16}\ \overline{18}\ \overline{21}\ \overline{11}\ \overline{2}$

Making Practice Fun 21

Name_____

Positive and Negative Exponents

DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Rename using negative exponents.

1. $\frac{1}{3^5} = 3^{-5}$
2. $\frac{1}{x^4}$
3. $\frac{1}{c^8}$
4. $\frac{1}{3^2}$
5. $\frac{1}{7^7}$
6. $\frac{1}{y^{10}}$
7. $\frac{1}{8^3}$

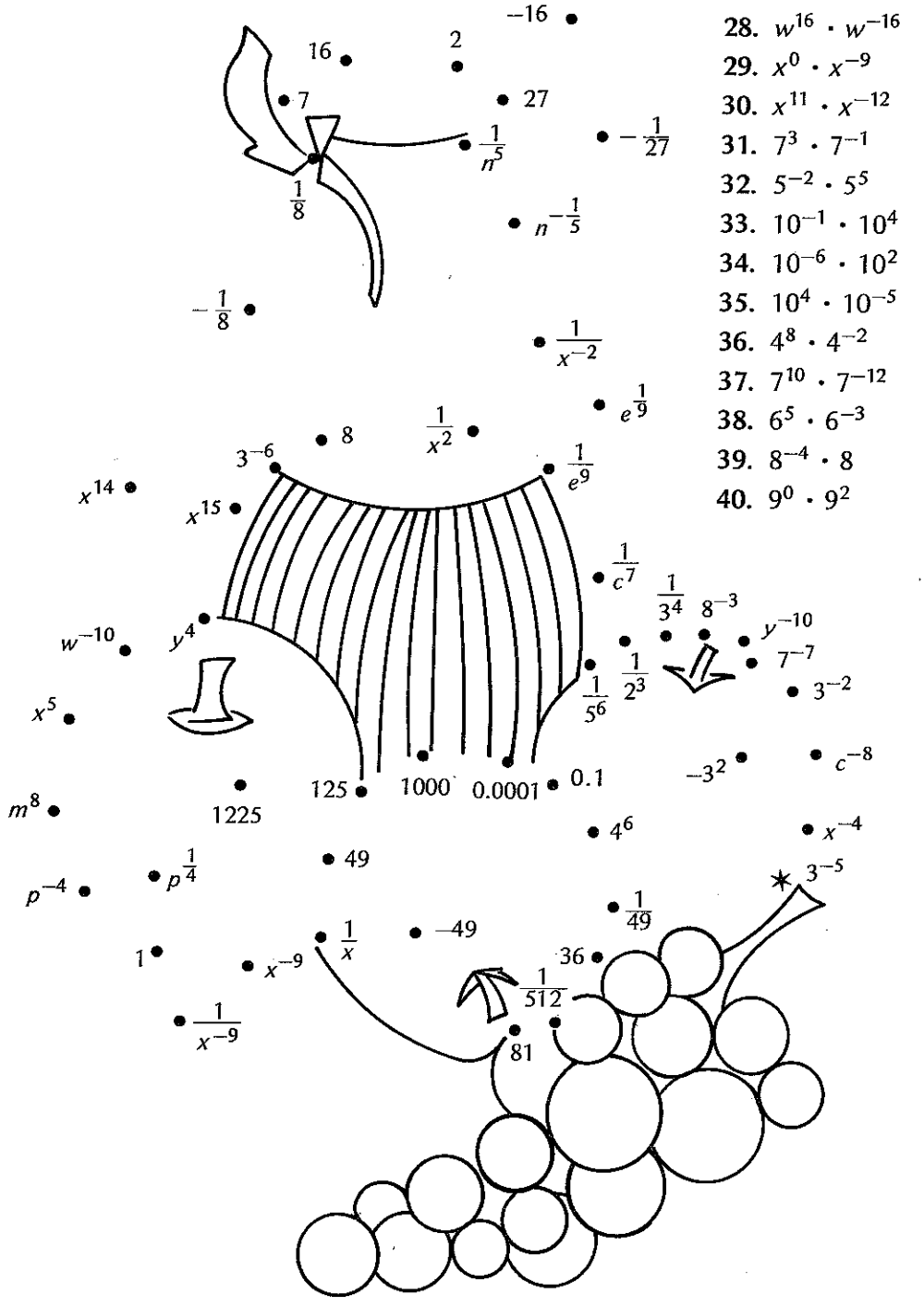
Rename using positive exponents.

8. 3^{-4}
9. 2^{-3}
10. 5^{-6}
11. c^{-7}
12. e^{-9}
13. x^{-2}
14. n^{-5}

Multiply and simplify.

15. $3^5 \cdot 3^{-2}$
16. $2^{-4} \cdot 2^5$
17. $4^0 \cdot 4^2$
18. $7^{-1} \cdot 7^2$
19. $8^{-3} \cdot 8^2$
20. $2^{-5} \cdot 2^8$
21. $3^{-2} \cdot 3^{-4}$
22. $x^8 \cdot x^7$
23. $y^0 \cdot y^4$
24. $w^{-2} \cdot w^{-8}$
25. $x^{-6} \cdot x^{11}$
26. $m^{-12} \cdot m^{20}$
27. $p^{-11} \cdot p^7$

28. $w^{16} \cdot w^{-16}$
29. $x^0 \cdot x^{-9}$
30. $x^{11} \cdot x^{-12}$
31. $7^3 \cdot 7^{-1}$
32. $5^{-2} \cdot 5^5$
33. $10^{-1} \cdot 10^4$
34. $10^{-6} \cdot 10^2$
35. $10^4 \cdot 10^{-5}$
36. $4^8 \cdot 4^{-2}$
37. $7^{10} \cdot 7^{-12}$
38. $6^5 \cdot 6^{-3}$
39. $8^{-4} \cdot 8$
40. $9^0 \cdot 9^2$



Making Practice Fun 22 Name_____

Working With Rational Numbers as Exponents

INFORMATION TIME

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

Divide and simplify.

1. $\frac{8^6}{8^2} = 8^4$
2. $\frac{6^3}{6^{10}}$
3. $\frac{4^8}{4^6}$
4. $\frac{3^{-8}}{3^{-2}}$
5. $\frac{7^{-3}}{7^{-2}}$
6. $\frac{5^{-2}}{5^{-12}}$
7. $\frac{x^4}{x^{-11}}$
8. $\frac{y^{-3}}{y^{11}}$
9. $\frac{a^{-4}}{a^{-2}}$
10. $\frac{x^{-9}}{x^0}$
11. $\frac{x^9}{x^{-9}}$
12. $\frac{m^8}{m^0}$
13. $\frac{q^0}{q^9}$
14. $\frac{6^{-7}}{6^{-1}}$
15. $\frac{11^{-50}}{11^{-25}}$
16. $\frac{11^{50}}{11^{49}}$

Simplify.

17. $(3^4)^5$
18. $(4^7)^6$
19. $(x^4)^{-2}$
20. $(y^{-3})^{-2}$
21. $(x^4y^{-8})^2$
22. $(x^3y^7)^{-4}$
23. $(3^{-1}a^6)^2$
24. $(4x^{-2}y^{-4})^2$
25. $(x^4)^{-8}$
26. $(y^{-3})^{-5}$
27. $(y^{-3})^{10}$
28. $(m^3p^4)^{-2}$
29. $2(9^{-2})^0$
30. $(5m^{-1}p^2)^{-2}$
31. $(3x^5y^2)^0$
32. $(x^{-3}y^{-2})^{-5}$
33. $(a^{-6}c^{-4})^{-2}$
34. $(y^3w^{-5})^3$
35. $(8^{-3})^{-1}$
36. $(6^{-1})^{-1}$
37. $(2^{50})^{-50}$
38. $(3^{-10})^{-10}$
39. $(6x^2)^{-1}$
40. $(9^{-1}x^{-3}y^2)^{-10}$
41. $(ace)^{-2}$
42. $(8^{23})^{-2}$

What did Archimedes say when he discovered how to measure the volume of an object by the amount of water it displaces?

W 8^4	**O** y^6	**W** y^{-14}	**I** $m^{-6}p^{-8}$	**M** 11^{-25}	**A** $16x^4y^8$	**G** 16	**E** 11
I $x^{-12}y^{-28}$	**L** x^{-9}	**O** y^9w^{-15}	**O** 8^3	**K** $3^{-6}y^{12}w^9$	**H** m^8	**O** $\frac{1}{9}a^{12}$	**W** a^{-2}
D 6^{-6}	**O** 2	**B** 4^{42}	**E** 3^{-20}	**L** x^8y^{-16}	**I** 6^{-7}	**E** 6	**V** y^{-30}
T 8^{-46}	**E** 3^{-6}	**R** $-a^2$	**R** x^{-32}	**I** 3^{100}	**F** x^{-8}	**I** 5^{10}	**C** y^{15}
S q^{-9}	**U** $\frac{1}{4^{42}}$	**M** x^{18}	**U** $a^{12}c^8$	**M** 7^{-1}	**J** $\frac{1}{a^2c^2e^2}$	**O** 3^{20}	**Y** 1
E y^{-6}	**N** x^{15}	**C** $\frac{m^2}{25p^4}$	**O** $\frac{1}{6x^2}$	**R** $\frac{16}{x^4y^8}$	**E** $x^{15}y^{10}$	**I** 2^{-2500}	**E** $9^{10}c^{30}y^{-20}$

Making Practice Fun 23 Name_____

Integers and Rational Numbers—Solving Equations and Problems

CROSS NUMBER PUZZLE

1. Work each exercise.
2. If the answer is positive, write it in the correct squares.
3. If the answer is negative, include the minus sign with the first digit of the answer.

Across

1. $x + 16 = 5 \quad x = -11$

3. $\frac{y}{7} = -12$

5. $-\frac{x}{10} = -101$

7. $324 - x = 412$

8. $x - 4\frac{1}{3} = 9\frac{2}{3}$

9. $\frac{x}{6} - 39 = 130$

11. $3 \cdot x = -45$

12. $8\frac{1}{4} + x = -24\frac{3}{4}$

14. $\frac{x}{0.4} = 6.25$

15. $-\frac{1}{7}x = 9$

17. $-x + 52 = -12$

19. $-\frac{2}{3}x = 46$

21. $4 - x = 23$

22. $-5x = -95$

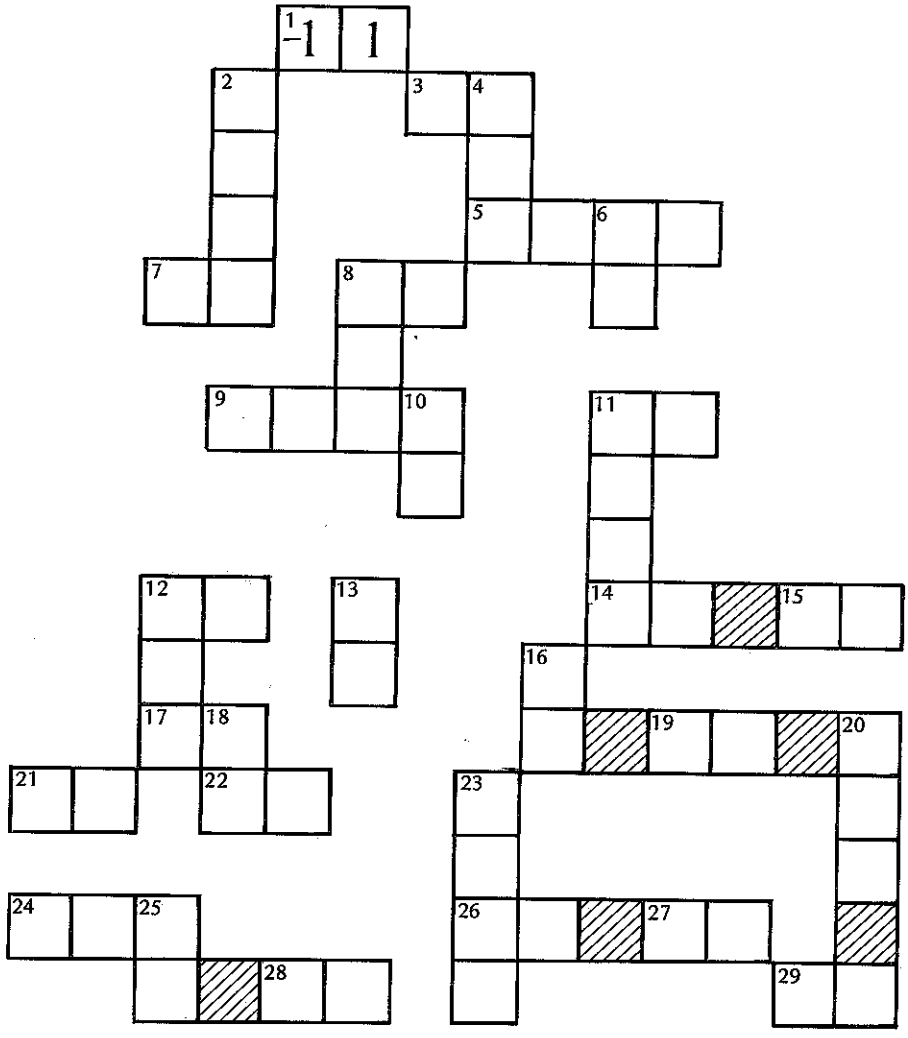
24. $-\frac{x}{41} = 5$

26. $-\frac{x}{7} = -7$

27. $2.3x = -119.6$

28. $-\frac{3}{5} + x = \frac{82}{5}$

29. A radio is sold for \$48. This is two-thirds of the regular price. What is the regular price?



Down

2. $x - 75.3 = 3042.7$

4. $n + 282.4 = 713.4$

6. $m + 78 = 89$

8. $\frac{x}{11} = 11$

10. $0.2x = 8$

11. $-3x = 4986$

12. $-\frac{x}{6} = 56$

13. $x + 11.8 = -5.2$

16. $x - \frac{3}{5} = 9\frac{2}{5}$

18. $x + 59 = 100$

20. $-\frac{x}{5} = 10 - (-10)$

23. $0.12x = 172.8$

25. A dress is on sale for \$33. This is $\frac{3}{5}$ of the regular price. What is the regular price?

Making Practice Fun 24 Name_____

Solving Equations Using the Addition Principle

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

Solve, using the addition principle.

1. $x + 19 = 42 \quad x = 23$
2. $x - 32 = 17$
3. $x + 1.6 = 3.4$
4. $x - 4.5 = -8.9$
5. $x - \frac{3}{4} = -7$
6. $x - 2\frac{7}{10} = 1\frac{1}{10}$
7. $x + \frac{3}{8} = \frac{1}{2}$
8. $-9 + x = 24$
9. $-\frac{2}{7} + x = \frac{1}{4}$
10. $\frac{1}{6} + x = -\frac{1}{15}$
11. $y + 45 = -29$
12. $\frac{3}{4} + x = 2\frac{1}{4}$
13. $-\frac{2}{3} + y = \frac{1}{6}$
14. $-25.6 = -2.6 + m$
15. $11.3 = 4.5 + w$
16. $-7.9 + q = -33.7$
17. $x + 0.08 = 0.1$
18. $x - \frac{1}{3} = \frac{1}{9}$
19. $\frac{7}{8} + x = \frac{1}{4}$
20. $46.75 + w = 15.02$
21. $x - 44 = -90$
22. $x - 1\frac{1}{5} = 5\frac{1}{2}$

You will find a message.

O	**H**	**D**	**E**	**A**	**R**	**W**	**H**	**A**	**T**
-31.73	$\frac{15}{28}$	49	-25.8	31.73	$\frac{5}{6}$	$1\frac{1}{2}$	-4.4	$6\frac{7}{10}$	$-\frac{5}{8}$
A	**M**	**E**	**S**	**S**	**Y**	**P**	**A**	**G**	**E**
-46	-49	13.92	$-5\frac{1}{4}$	$\frac{15}{13}$	$3\frac{4}{5}$	$-6\frac{1}{4}$	$6\frac{9}{10}$	$\frac{5}{8}$	$\frac{13}{28}$
W	**E**	**H**	**A**	**V**	**E**	**H**	**E**	**R**	**E**
23	$\frac{4}{9}$	0.02	$\frac{1}{8}$	-74	6.8	-23	1.8	$-\frac{7}{30}$	33

Making Practice Fun 25 Name_____

Solving Equations Using the Multiplication Principle

MESSAGE IN CODE

1. Work each exercise.
2. Find the code letter for that answer.
3. Write the code letter in the blank by the exercise number. You may use the same code letter several times.

Exercises

Solve, using the multiplication principle.

Y 1. $7x = 42 \quad x = 6$

2. $3x = 54$

3. $-4x = 76$

4. $-12x = 156$

5. $2x = 36$

6. $-2x = 38$

7. $\frac{2}{3}x = 8$

8. $-\frac{3}{4}x = 18$

9. $2.3y = 69$

10. $\frac{1}{8} = \frac{1}{3}W$

11. $2y = -26$

12. $31.4m = 84.78$

13. $8 = -\frac{1}{4}t$

14. $\frac{4}{9}x = \frac{1}{6}$

15. $75 = 15x$

16. $\frac{2}{3}x = 12$

17. $-\frac{3}{8}x = 12$

18. $6x = -144$

19. $-2.3 = \frac{1}{2}y$

20. $4x = -144$

21. $-2.4x = 31.2$

22. $-3.8y = 157.7$

23. $\frac{3}{8} = -\frac{1}{8}m$

24. $\frac{1}{4}x = -9$

25. $-\frac{4}{5}x = -24$

26. $18.5 = 3.7x$

27. $10x = 27$

28. $-\frac{1}{5}R = 4\frac{4}{5}$

29. $6R = -216$

30. $\frac{1}{2}R = \frac{3}{16}$

31. $0.1R = -0.46$

Code Letter	Answer
A	-36
B	30
C	-3
D	-24
E	$\frac{3}{8}$
F	36
G	4.6
H	-30
I	2.7
J	32
K	-41.5
L	12
M	-5
N	-27
O	18
P	0.027
Q	33
R	-4.6
S	-32
T	5
U	-19
V	$-\frac{3}{8}$
W	-13
X	-18
Y	6
Z	24

Making Practice Fun 26 Name_____

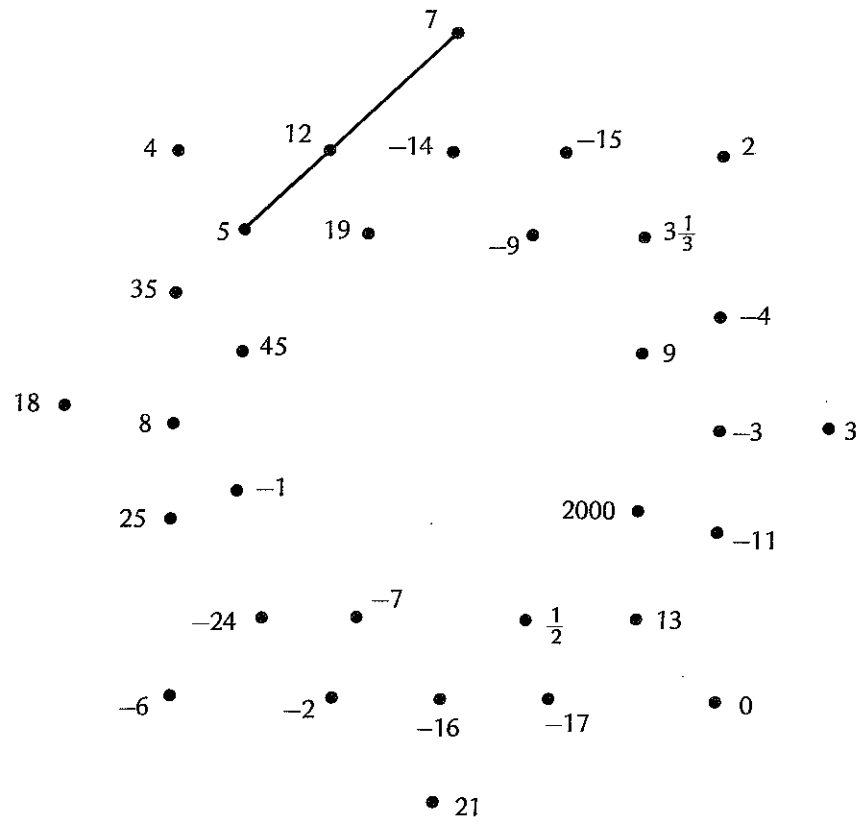
Solving Equations Using Both the Addition and Multiplication Principles

DIAGRAM PUZZLE

1. Work Exercise A1 and Exercise B1.
2. Draw a straight line segment connecting these two answers.
3. Continue with Exercise A2 and Exercise B2, and so on.

Exercises A

1. $3x + 9 = 30 \quad x = 7$
2. $8x - 9 = 7$
3. $4y - 26 = 10$
4. $5x + 83 = 53$
5. $-3x + 8 = 29$
6. $-8y + 35 = 11$
7. $-4w - 23 = -107$
8. $-2p + 62 = 90$
9. $3j - 16 = 59$
10. $3x + 4x = 28$
11. $6x + 2x = -16$
12. $-4y - 3y = 63$
13. $-3.2y - 1.4y = -9.2$
14. $-3x + 9x = 0$
15. $1.1x - 6x = -34.3$
16. $x + \frac{2}{3} = 4$
17. $\frac{3}{10}x = 1$
18. $0.24x + 3.8x = 2.02$
19. $-7x - 16x = -92$
20. $x + 0.1x = -26.4$
21. $-8x + 3 = -37$
22. $3x + 9 = 9$
23. $4x - 70 = 2$
24. $-2x + 68 = 100$



Exercises B

1. $4x + 8 = 28 \quad x = 5$
2. $3x + 20 = 8$
3. $6y - 48 = 30$
4. $2y + 31 = -1$
5. $-4y + 11 = -21$
6. $6y + 29 = -37$
7. $-3m + 50 = 11$
8. $6k - 83 = 187$
9. $13k + 100 = 22$
10. $3x + 5x = 96$
11. $4x - 3x = 21$
12. $-2y - 3y = 15$
13. $8y - 6y = -28$
14. $8x - 9x = 17$
15. $8x - 10x = 30$
16. $\frac{1}{3}x - 6 = -5$
17. $3x - 11x = -152$
18. $\frac{3}{8}x - \frac{1}{2}x = 3$
19. $125x - 143x = -144$
20. $3x - 4x = -18$
21. $-8x - 4x = 12$
22. $7x + 20 = -1$
23. $2.1x - 70 = 3.5$
24. $0.01x - 7 = 13$

Making Practice Fun 27

Name_____

Solving Equations Containing Parentheses

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

Solve.

1. $2(3y + 4) = 32 \quad y = 4$
2. $3(4y - 5) = 69$
3. $36 = 3(7t + 5)$
4. $156 = 4(6w - 9)$
5. $6x - (3x + 7) = 29$
6. $5m - (6m + 9) = 11$
7. $9m - (4m - 8) = 53$
8. $13x - (5x - 11) = -13$
9. $4(3x + 2) - 16 = 16$
10. $7(2x - 3) = 3(4x - 11)$
11. $6(5y + 7) = 7(4y - 10)$
12. $5(e + 6) = 4(e + 7)$
13. $9(x + 8) + 12 = 8(x + 8) + 10$
14. $18 - (3x + 5) = 5(x - 1) - 6$
15. $\frac{1}{3}(9x + 27) - 4 = \frac{1}{2}(2x + 54)$
16. $\frac{1}{5}(25x - 75) + 9 = \frac{1}{4}(8x + 36)$
17. $26 - (4x - 11) = -5(x + 7)$
18. $4(9y - 5) = 10(3y + 17) - 40$
19. $2(x - 13) = x - 31$
20. $5(x - 11) = 3x - 43$
21. $7(x + 1) = 2x + 57$
22. $5(x - 2) = -30$
23. $\frac{1}{7}(x + 21) = -6$
24. $2(x - 8) = -16 - 2$

O 3	**N** 2	**E** −10	**I** −7	**N** 8	**C** −72	**H** −2	**M** 6
T −20	**E** −56	**N** −5	**C** −25	**L** 4	**U** 11	**E** −4	**A** −1
T 9	**W** 7	**O** 5	**U** 56	**O** −3	**E** −63	**A** 25	**T** 1
S −15	**M** 63	**A** −12	**R** −11	**T** 20	**E** −6	**R** 10	**H** 12

Making Practice Fun 28 Name_____

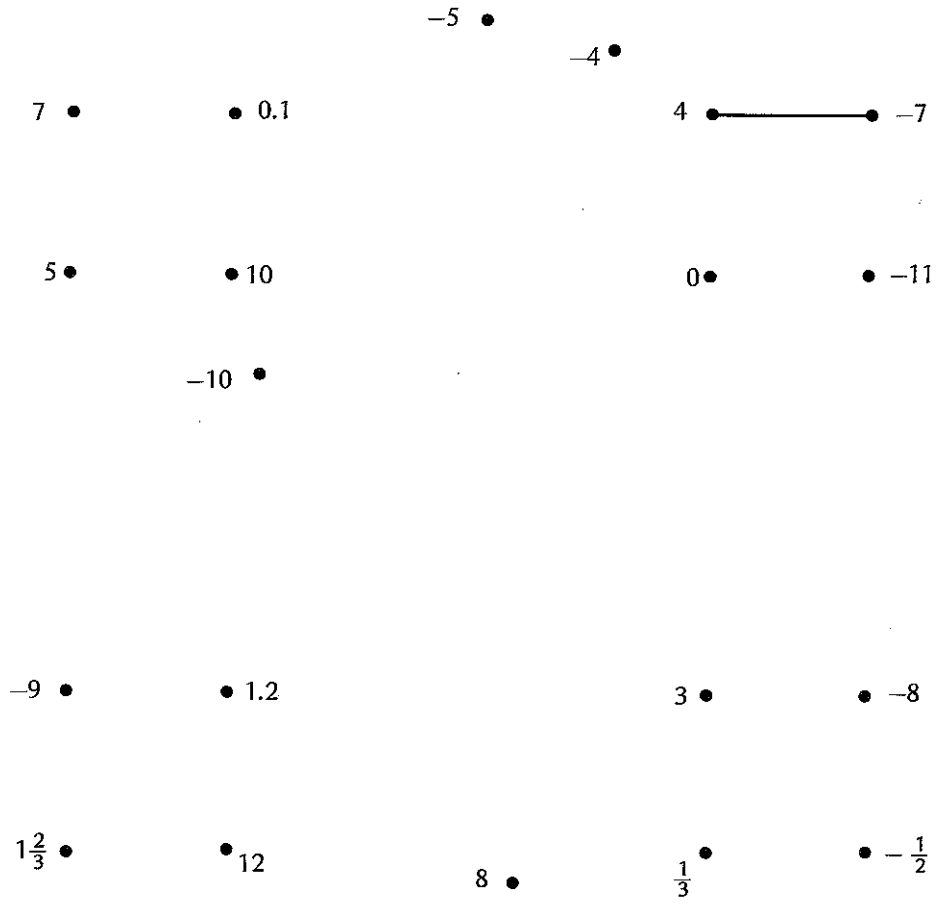
Solving Equations Using the Principle of Zero Products

DIAGRAM PUZZLE

1. Work each exercise by finding the two solutions to the equation.
2. Connect the answers to each other.

Exercises

1. $(x + 7)(x - 4) = 0$ $-7, 4$
2. $(x + 8)(x - 5) = 0$
3. $(x - 12)(x - 4) = 0$
4. $(x + 9)(x + 11) = 0$
5. $(\frac{2}{5}x - 2)(\frac{5}{7}x - 5) = 0$
6. $(2x + 1)(x + 8) = 0$
7. $(3x - 5)(x - 12) = 0$
8. $3.2x(6x - 7.2) = 0$
9. $(\frac{3}{4}y - \frac{1}{4})(\frac{1}{2}y - \frac{3}{2}) = 0$
10. $(3x - 1)(2x + 1) = 0$
11. $2x(x + 11) = 0$
12. $(0.1x - \frac{1}{100})(0.01x - \frac{1}{10}) = 0$
13. $(x - 10)(x - 3) = 0$
14. $(x + 9)(3x - 3.6) = 0$
15. $(\frac{2}{3}x - \frac{2}{9})(20x - 2) = 0$
16. $(x + 8)(x - 3) = 0$
17. $(x - 12)(5x - 6) = 0$
18. $3(2x - 10)(7x - 70) = 0$
19. $(\frac{2}{7}x - 2)(\frac{1}{3}x - \frac{1}{30}) = 0$
20. $0.3x(\frac{2}{11}x - \frac{8}{11}) = 0$
21. $(8x + 56)(x + 11) = 0$
22. $(2x + 18)(\frac{1}{5}x - \frac{1}{3}) = 0$



Name_____

Solving Equations—Problem Solving

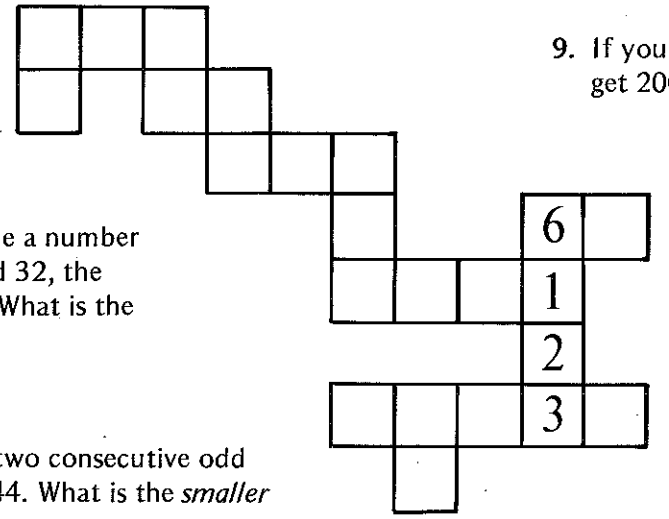
FILL IN THE NUMBERS PUZZLE

1. Work all the exercises first.
2. Fit the answers into the diagram, down or across, so that digits match correctly.

Exercises

1. When 2246 is subtracted from twice a certain number, the result is 10,000. What is the number? 6123

2. When 18 is added to 6 times a certain number, the result is 168. What is the number?



3. If you double a number and then add 32, the result is 80. What is the number?

4. The sum of two consecutive odd integers is 244. What is the *smaller* integer?

5. The perimeter of a rectangle is 256 m. The length is 16 m greater than the width. What is the width of the rectangle?

6. The perimeter of a rectangle is 524 cm. The length is 42 cm more than the width. What is the length of the rectangle?

7. If you add one-third of a number to the number itself, you get 16. What is the number?

8. When 125 is subtracted from one-third of a number, the result is 2. What is the number?

9. If you triple a number and add 11, you get 200. What is the number?

10. If you add one-third of a number to itself, you get 1348. What is the number?

11. One-fifth of the population of a midwest city is 8466. What is its population?

12. A wire, 224 cm long, is cut into three pieces. The first is twice as long as the second. The third is one-half as long as the second. How long is the second piece?

Making Practice Fun 30 Name_____

Solving Formulas for a Specified Letter

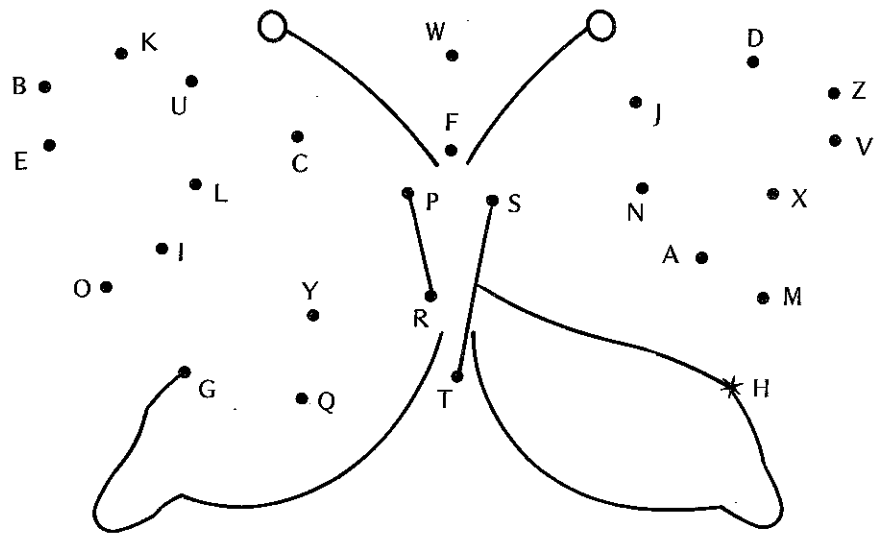
DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot letter for that answer.
3. Connect the dot letters in order.

Exercises

Solve for the indicated letter.

1. $F = ma$ for a $\quad a = \frac{F}{m}$ H
2. $A = l \cdot w$ for w
3. $F = \frac{mv^2}{r}$ for v^2
4. $W = F \cdot S$ for F
5. $E = m \cdot g \cdot h$ for g
6. $E = mc^2$ for m
7. $D = \frac{M}{V}$ for V
8. $A = \frac{(h_1 + h_2) \cdot h}{2}$ for h
9. $E = I\,R$ for R
10. $P = I^2R$ for R
11. $P = I^2R$ for I^2
12. $V = \frac{\pi R^2 h}{3}$ for h
13. $P = 2l + 2w$ for w
14. $C = \frac{5}{9}(F - 32)$ for F
15. $R = \frac{I}{PT}$ for I
16. $h = \frac{3P}{w}$ for w
17. $S = 2l[w + h] + 2wh$ for l
18. $V = \frac{\pi R^2 h}{3}$ for R^2
19. $S = Vt + \frac{1}{2}at^2$ for a
20. $L = \frac{3MP^2}{Q}$ for P^2
21. $F = \frac{mM}{R^2}$ for R^2
22. $F = \frac{mM}{R^2}$ for M



Dot Letter	Answer
A	$\frac{F \cdot r}{m}$
B	PRT
C	$\frac{3V}{\pi R^2}$
D	$\frac{M}{D}$
E	$\frac{3P}{h}$
F	$\frac{P}{I^2}$
G	$\frac{2(S - Vt)}{t^2}$
H	$\frac{F}{m}$
I	$\frac{(S - 2wh)}{2(w + h)}$
J	$\frac{2A}{(h_1 + h_2)}$
K	$\frac{9}{5}C + 32$
L	$\frac{3h}{P}$
M	$\frac{A}{l}$
N	$\frac{D}{M}$
O	$\frac{3V}{\pi h}$
P	$\frac{P}{R}$
Q	$\frac{m}{FM}$
R	$\frac{mM}{F}$
S	$\frac{E}{I}$
T	$\frac{FR^2}{m}$
U	$\frac{(P - 2I)}{2}$
V	$\frac{E}{mh}$
W	$\frac{I}{E}$
X	$\frac{W}{S}$
Y	$\frac{LQ}{3M}$
Z	$\frac{E}{c^2}$

Making Practice Fun 31 Name_____

Polynomials—Evaluating, Collecting Like Terms

FACTS ABOUT BIRDS

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Evaluate for $x = 3, y = -2$.

1. $-7x + 8 = -13$ K
2. $-9y - 7$
3. $8x^2 - 4x + 1$
4. $3y^2 + 2y - 7$
5. $-7y^3 - 3y - 1$
6. $-9x^2 + 8x + 5$
7. $10y^3 - 14y$
8. $x^3 - 2x^2 + 11$
9. $4x^2 - 10x + 4$
10. $9x + 12y + 8$
11. $3y - 1\frac{2}{5}$
12. $-x + x^2 + 14$
13. $4y + \frac{3}{5}$
14. $-x + x^2 - 3\frac{3}{4}$
15. $y^5 + 2y^4$

Collect like terms.

16. $3x - 11x$
17. $4x^2 + 3x^2$
18. $3x^2 - 2x + 6x^2$
19. $3x^4 - 7x^4 + 2$
20. $7x^2 - 4x - 7x^2 + 4x$
21. $\frac{5}{6}x^3 - \frac{1}{2}x^2 + \frac{1}{6}x^3 + \frac{1}{2}x^2$
22. $\frac{3}{8}x^4 + \frac{1}{3}x^3 - \frac{1}{4}x^4 + \frac{1}{2}x^3$
23. $9x^2 - 34 - 10x^2 - 18 + x^2$
24. $8a^4 - 3a + 4a - 2a^4$
25. $6x^4 - 2x^3 - 8x^4 + 2x^3 + 2x^4$
26. $3a^4 - 2a^3 + 3a^4 + 3a^3 - a + 2a - a^3$
27. $4x^3 - 5x^2 - 6x - 4x^3 + 14x^2 + 4x$
28. $8x^2 - 5 - 4x^2 + 8 - 4x^2 + 7$
29. $17x^3 - 2 - 3x^3 + 3 - 14x^3$
30. $3a^4 + 27 + 9a^4 + 35 - 12a^4 - 1$
31. $\frac{1}{2}x^4 + \frac{1}{4}x^3 + \frac{7}{12}x^3 - \frac{3}{8}x^4$
32. $\frac{5}{4}x^2 - \frac{5}{4} - x^2 - \frac{1}{4}x^2 + 3\frac{1}{2}$
33. $4x^3 - 2x^2 + 9x^2 - 3x^3 - x^3$
34. $6x^8 - 4x^5 + 20 - 4x^8 + 4x^5 + 2x^8$
35. $9a^4 - 3a^4 + a - 3a + 5a$

Code Letter	Answer
A	$6a^4 + a$
B	$6a^4 - a$
C	$\frac{1}{8}x^4 + \frac{5}{6}x^3$
D	10
E	0
F	13
G	$-7\frac{2}{5}$
H	$6a^4 + 3a$
I	$7x^2$
J	$3\frac{1}{4}$
K	-13
L	$2\frac{1}{4}$
M	$-8x$
N	20
O	$9x^2 - 2x$
P	61
Q	$-7\frac{3}{5}$
R	-52
S	$-4x^4 + 2$
T	x^3
U	$4x^8 + 20$
V	1
W	11
X	$4x^4 + 2$
Y	$7x^3$
Z	$6x^2$

This bird has keen eyesight, sharp talons, and preys on rabbits:

$\overline{26}\ \overline{16}\ \overline{25}\ \overline{6}\ \overline{33}\ \overline{22}\ \overline{24}\ \overline{12}\quad \overline{11}\ \overline{18}\ \overline{19}\ \overline{35}\ \overline{26}\ \overline{10}\ \overline{\frac{K}{1}}$

This bird dwells in marshes and is related to the crane:

$\overline{15}\ \overline{34}\ \overline{23}\ \overline{27}\ \overline{3}\ \overline{20}\ \overline{24}\ \overline{8}\quad \overline{31}\ \overline{18}\ \overline{27}\ \overline{21}$

This bird flies nonstop from Canada to South America:

$\overline{13}\ \overline{27}\ \overline{32}\ \overline{28}\ \overline{20}\ \overline{8}\quad \overline{5}\ \overline{14}\ \overline{27}\ \overline{4}\ \overline{25}\ \overline{23}$

This bird, the largest pigeon, drinks by sucking up water:

$\overline{29}\ \overline{33}\ \overline{31}\ \overline{21}\ \overline{27}\ \overline{7}\ \overline{17}\ \overline{26}\quad \overline{22}\ \overline{23}\ \overline{27}\ \overline{2}\ \overline{12}\ \overline{25}\ \overline{9}\quad \overline{30}\ \overline{33}\ \overline{13}\ \overline{20}\ \overline{27}\ \overline{12}$

Making Practice Fun 32 Name _____

Polynomials—Collecting Like Terms, Descending Order

FACTS ABOUT THE GRAND PRIX

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Collect like terms and arrange in descending order.

1. $3x^5 - 4x^3 + 2x^5 + 6x^3 = 5x^5 + 2x^3$ T
2. $-8x^2 + 5x^3 + 4x^2 - 2x^3 + x^2$
3. $3x^{10} - 2x^9 - x^8 + 2x^7 + 2x^9 - 14x^7 + 3x^{10}$
4. $8x^4 + 5x^6 - 6x^5 + 2x^7 - 8x^4 - 7x^6 + 11x^5 - 5x^7$
5. $4x^3 - 9x^4 - x^3 + 7x^4 + 6x^2 + 2x^4 - 3x^2$
6. $4x^2 - 3x^5 + 7x^2 - 4x^5 + x^8 - x^5$
7. $5x^7 - 8x^{10} + 7x^7 + 2x^{10} + x^8$
8. $4x^2 - 7x^3 + 2x^2 - 9x + 10x^3 - 4x^2$
9. $8a^9 - 4a^{10} + 2a^5 - 7a^9 - a^9 + a^5$
10. $-2a - 3a - a^4 - a^4 + 3a^8$
11. $7x^4 + 3x^3 + 2x^2 - 7x^4 + 2x^2$
12. $4x^3 - 19x - x^3 + 2x^2 + 10x$
13. $2a^4 - 3a^5 - 9a^{10} + 5a^{10} - 2a^4$
14. $3a^3 + 6a - 2a^2 - 5a + a^2 - a^3$
15. $2x^3 - 3x^2 + x^3 - 9x + 5x^2$
16. $-3x^2 - 9x^2 + 8x^4 - 2x^4 - x^3$
17. $-a^{11} - a^{10} - a^5 + a^{11} - 3a^{10} - 2a^5$
18. $3x^{10} - 11x^7 + x^6 - x^7 + 3x^{10} - x^8 - x^6$
19. $3x^6 + 2x^5 + 3x^3 - 2x^6 + 3x^5 - x^3 - x^6$
20. $-5x^2 - 9x^2 - 4x^3 + 3x^3 + 2x^4 + 4x^4$
21. $-x^5 - x^6 - x^7 + 12x^5 - x^6 - 2x^7$
22. $a^3 - a^2 + a + a^3 - a^2 + 5a$
23. $10x^5 + 10x^6 - 3x^7 - 5x^5 - 8x^6$
24. $a^9 + a^8 + 2a^4 + 5a - a^9 + 2a^8$
25. $x^5 + x^6 + x^7 + 4x^5 + x^6 - 4x^7$
26. $-20x^2 + x^3 + 6x^4 + 6x^2$

Code Letter	Answer
A	$-3x^7 + 2x^6 + 5x^5$
B	$-6x^{10} + x^8 + 12x^7$
C	$x^8 - 8x^5 + 11x^2$
D	$-3x^7 - 2x^6 + 5x^5$
E	$6x^{10} - x^8 - 12x^7$
F	$6x^4 + x^3 - 14x^2$
G	$-2x^3 - 3x^2 + 15x$
H	$3x^3 + 3x^2$
I	$3x^3 + 2x^2 - 9x$
J	$6x^4 - x^3 - 12x^2$
K	$3x^3 + 4x^2$
L	$-4a^{10} - 3a^5$
M	$2a^3 - a^2 + a$
N	$3a^8 + 2a^4 + 5a$
O	$3x^3 - 3x^2$
P	$3a^8 - 2a^4 - 5a$
R	$-4a^{10} + 3a^5$
S	$2a^3 - 2a^2 + 6a$
T	$5x^5 + 2x^3$
U	$6x^4 - x^3 - 14x^2$
W	$-3x^7 - 2x^6 + 11x^5$

Who was the Grand Prix champion of the world in . . .

1950? ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ (Italian)
24 12 24 2 26 23 9 8 24 25

1960? ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ (Australian)
16 23 6 11 7 9 25 7 5 23 14

1961? ___ ___ ___ ___ ___ ___ ___ ___ (American)
10 5 15 17 5 8 17 13

1967? ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ (New Zealander)
4 18 24 8 22 5 20 17 14 3

1970? ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ T (Austrian)
16 2 6 5 18 24 9 15 24 4 1

1973? ___ ___ ___ ___ ___ ___ ___ T ___ ___ ___ ___ ___ (Scottish)
16 25 6 11 8 3 22 1 18 21 23 9 19

1974? ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ T ___ ___ ___ ___ (Brazilian)
3 14 18 9 22 2 24 26 15 19 1 8 10 23 17 4 12

Making Practice Fun 33

Name_____

Polynomials—Adding

INFORMATION TIME

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

Add.

1. $4x + 7$ and $-6x + 2$ $-2x + 9$
2. $3x^2 + 5x + 2$ and $-9x - 11$
3. $-4x^2 + 7x - 6$ and $3x^2 - 8x + 5$
4. $7x^3 - 3x^2$ and $-10x^3 + x^2$
5. $-9x + 8$ and $11x + 3$
6. $3x^4 + 5x^3 - 4x^2 + 8x - 2$ and $-3x^4 - 4x + 2$
7. $8x^2 - 2x + 7$ and $-3x^2 + 2x - 9$
8. $-9x^4 + 2x^3 - 5x$ and $7x^4 - 3x^3 + x^2 + 5x$
9. $15x^2 - 7x + 9$ and $-6x^2 - 2x - 9$
10. $11x^3 - 6x + 4$ and $2x^3 + 2x^2 - 4x - 4$
11. $a^5 - 2a^4 + 7a^2 - 1$ and $3a^5 + 2a^4 - 9a^2 + 1$
12. $(2a^3 - 4x + 8) + (-3a^3 - 9x - 8)$
13. $(6a^2 - 4a + 5) + (-9a^2 + 4a - 5)$
14. $(7a^4 - 3a^2 + 5) + (2a^4 - 3a^3 + 3a^2 - 4)$
15. $(-\frac{2}{3}t^3 + \frac{1}{4}t^2 - t) + (t^3 - \frac{1}{2}t^2 + t)$
16. $(-\frac{5}{8}t^4 + \frac{1}{2}t^3 + t^2) + (-\frac{3}{8}t^4 - \frac{1}{2}t^3 + 3t^2)$
17. $(8t^4 - 9t^2 + 7t) + (-8t^4 - 3t^3 + t^2 - 7t)$
18. $(9a^8 - 6a^4 + 2a^2) + (-3a^8 + 6a^4 + 2a^2 - a)$
19. $(-10a^4 + 3a^2 - a) + (8a^4 - 2a^2 + 2a^4 + 3a)$
20. $(\frac{3}{4}a^8 - \frac{2}{3}a^5 + a^2) + (\frac{1}{4}a^8 + \frac{2}{3}a^5 - a^2)$
21. $(-\frac{1}{8}x^3 + \frac{2}{3}x^2 - \frac{1}{2}x) + (\frac{1}{4}x^3 + \frac{1}{6}x^2 - \frac{1}{2}x)$
22. $(0.3x^4 + 0.1x^2 - 0.05x) + (0.7x^4 - 0.1x^2 + 0.2x - 0.8)$
23. $(2.5x^3 - 1.6x^2 + 3.6) + (2.5x^3 - 3.4x^2 - 3.6)$
24. $(9x^2 - 6x + 7) + (-3x^2 + 4x - 8)$
25. $(-x - x^2 - 1) + (x + x^2 - 1)$

Who was the winner of the first "Indianapolis 500" and what year did he win it?

D $-3a^2$	**1939** $-x^2 - x - 1$	**H** $4a^5 - 3a^2$	**S** $13x^3 + 2x^2 - 10x$	**1912** $6x^2 - 2x - 1$
E a^8	**V** $5x^3 - 5x^2$	**A** $-a^3 - 12x$	**1942** $-3t^3 - 8t^2$	**S** $x^4 + 0.15x - 0.8$
P $-2x^4 - x^3 + x^2$	**I** $-2x + 9$	**R** $-t^4 - 4t^2$	**O** $-t^4 + 4t^2$	**Y** $5x^3 - 4x^2 + 4x$
A $6a^8 + 4a^2 - a$	**C** $a^2 + 2a$	**R** $13x^3 + 2x^2 - 9x$	**A** $3a^2$	**Y** $a^8 + 1$
L $4a^5 - 2a^2$	**T** $5x^2 - 2$	**O** $2x + 12$	**L** $9a^4 - 3a^3 + 1$	**1911** $6x^2 - 2x + 1$
M $\frac{1}{3}t^3 - \frac{1}{4}t^2$	**O** -2	**U** $6a^8 - 4a^2 + a$	**1910** $\frac{1}{8}x^3 + \frac{5}{6}x^2 - x$	**R** $3x^2 - 4x - 9$
A $2x + 11$	**R** $9x^2 - 9x$	**N** $\frac{1}{3}t^3 - \frac{1}{2}t^2$	**N** $-3x^3 - 2x^2$	**K** $-a^3 - 13x$

Making Practice Fun 34

Name_____

Polynomials—Subtracting

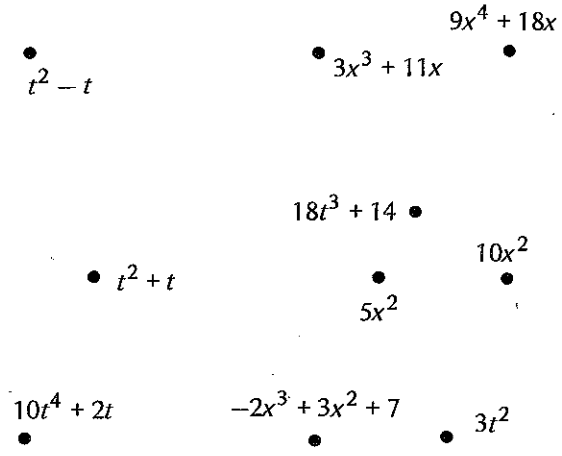
DIAGRAM PUZZLE

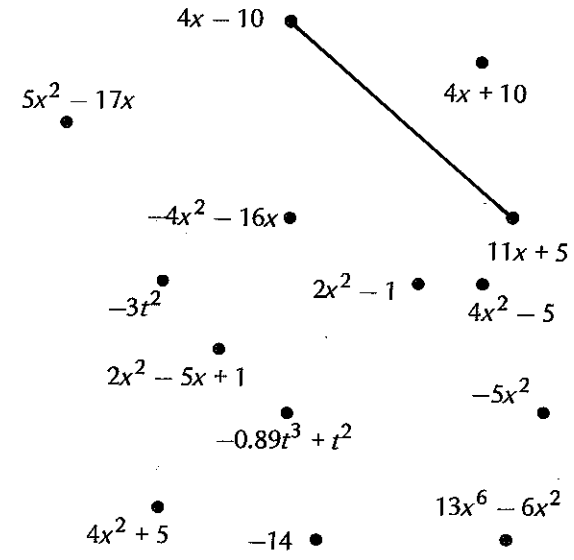
1. Work Exercise A1 and Exercise B1.
2. Draw a straight line segment connecting these two answers.
3. Continue with Exercise A2 and Exercise B2, and so on.

Exercises A

1. $(7x - 2) - (3x + 8) = 4x - 10$
2. $(4x^2 + 2) - (2x^2 + 3)$
3. $(7x^3 - 2x^2 + 3x) - (4x^3 - 2x^2 - 8x)$
4. $(9x^2 - 3x) - (7x^2 + 2x - 1)$
5. $(7x^2 - 8x + 2) - (2x^2 + 9x + 2)$
6. $(9x^6 - 3x^2 + 2) - (-4x^6 + 3x^2 + 2)$
7. $(2.3x^2 - 4.1x) - (-1.7x^2 - 4.1x - 5)$
8. $(\frac{1}{2}t^2 - \frac{1}{3}t + 1) - (-\frac{1}{2}t^2 + \frac{2}{3}t + 1)$
9. $(\frac{4}{5}t^3 + \frac{1}{10}t^2 - \frac{1}{3}t) - (\frac{4}{5}t^3 - \frac{9}{10}t^2 + \frac{2}{3}t)$
10. $(9t^3 - 8t^2 + 7) - (-9t^3 - 8t^2 - 7)$
11. $(0.01t^3 - 2.16t^2) - (0.9t^3 - 3.16t^2)$
12. $(-8x^2 - 8x - 1) - (-4x^2 + 8x - 1)$
13. $(8x^3 - 4x^2) - (8x^3 + x^2)$
14. $(-7x - 8) - (-11x + 2)$
15. $(9t^4 - 11t^2 + 13t) - (-t^4 - 11t^2 + 11t)$
16. $(5t^2 - 6t + 9) - (8t^2 - 6t + 9)$
17. $(3x^2 - 9x + 1) - (x^2 - 9x + 2)$
18. $(4t^2 - 9t) - (t^2 - 9t)$
19. $(8t^2 - t) - (11t^2 - t)$
20. $(-10t^2 - t) - (-13t^2 - t)$

Where are the missing polygons?





Exercises B

1. $(9x + 3) - (-2x - 2) = 11x + 5$
2. $(3x^2 - 1) - (8x^2 - 1)$
3. $(4x^3 + 5x^2 + 2) - (6x^3 + 2x^2 - 5)$
4. $(8x^2 + 4x) - (-2x^2 + 4x)$
5. $(6x^4 - 2x^3 + 9x) - (-3x^4 - 2x^3 - 9x)$
6. $(8x^3 - 7x^2 - 7) - (8x^3 - 7x^2 + 7)$
7. $(10x^2 - 11x + 8) - (8x^2 - 6x + 7)$
8. $(-7x^3 - 9x^2 + 4x) - (-10x^3 - 9x^2 - 7x)$
9. $(7t^4 - 3t^3 + t) - (-3t^4 - 3t^3 - t)$
10. $(7x^4 - 3x^2 - 9x) - (-2x^4 - 3x^2 - 27x)$
11. $(9t^3 - 4t + 8) - (9t^3 - 4t + 22)$
12. $(9x^2 - 3x + 11) - (9x^2 - 14x + 6)$
13. $(-10x^6 - x^5 - x^2) - (-23x^6 - x^5 + 5x^2)$
14. $(x^2 - 2x - 4) - (5x^2 + 14x - 4)$
15. $(x^2 - 6) - (2x^3 - 2x^2 - 13)$
16. $(x^2 - 11x + 2) - (-4x^2 + 6x + 2)$
17. $(2.3t^3 - 1.1t^2) - (3.19t^3 - 2.1t^2)$
18. $(7x^2 - x) - (-3x^2 - x)$
19. $(17t^3 - t - 5) - (-t^3 - t - 19)$
20. $(-7x^2 - 5) - (-11x^2 - 10)$

Making Practice Fun 35 Name_____

Polynomials—Multiplying Monomials and Binomials

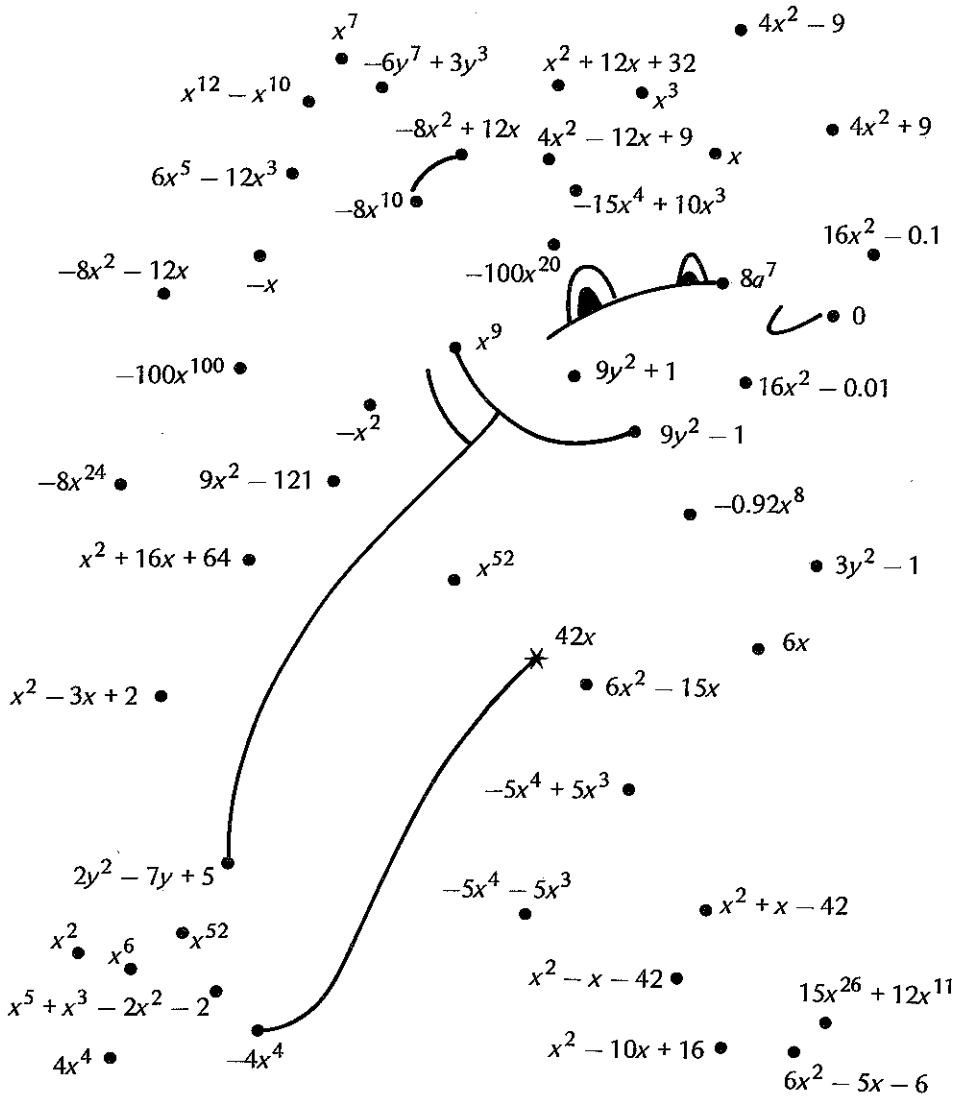
DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Multiply.

1. $6x$ and $7 \quad 42x$
2. $3x$ and $2x - 5$
3. $-5x^2$ and $x^2 - x$
4. $(x + 6)(x - 7)$
5. $(x - 8)(x - 2)$
6. $(2x - 3)(3x + 2)$
7. $3x^5$ and $(5x^{21} + 4x^6)$
8. $-3x$ and -2
9. $0.4x^3$ and $-2.3x^5$
10. $(3y - 1)(3y + 1)$
11. $(4x - 0.1)(4x + 0.1)$
12. $-12x^3$ and 0
13. $-4a^2$ and $-2a^5$
14. $-6x$ and $-\frac{1}{6}$
15. $\frac{3}{4}x^2$ and $\frac{4}{3}x$
16. $(x + 8)(x + 4)$
17. $4x$ and $-2x + 3$
18. $(2x - 3)(2x - 3)$
19. $5x^2$ and $-3x^2 + 2x$
20. $-10x^{10}$ and $10x^{10}$
21. $\frac{1}{3}x^6$ and $3x^3$
22. $\frac{2}{3}x$ and $-\frac{3}{2}x$
23. $4x^6$ and $-2x^4$
24. $-3y^2$ and $2y^5 - y$
25. x^7 and 1
26. x^8 and $x^4 - x^2$
27. $3x^2$ and $2x^3 - 4x$
28. $(3x + 11)(3x - 11)$
29. $(x + 8)(x + 8)$
30. $(x - 1)(x - 2)$
31. $-x$ and $-x$
32. $-\frac{4}{5}x$ and $-\frac{5}{4}x^5$
33. $-x^{50}$ and $(-x^2)$
34. $(2y - 5)(y - 1)$
35. $(x^3 - 2)(x^2 + 1)$
36. $-2x^2$ and $2x^2$



Making Practice Fun 36

Name_____

Polynomials—Multiplying

INFORMATION TIME

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

Multiply.

1. $(x+1)(x^2-x+1) = x^3+1$
2. $(x+3)(x^2-x+3)$
3. $(3x^2-4x+3)(x^2-1)$
4. $(x^2+x+1)(x-1)$
5. $(x^3-x^2-x+1)(x-1)$
6. $(x^3+x^2+x+1)(x-1)$
7. $(3a^2-2a+1)(2a-3)$
8. $(2a^3-a)(a^2+1)$
9. $(a^3+a+1)(a^2+a-1)$
10. $(a^2-a+1)(a+1)$
11. $(6x^2+x-3)(2x^2+1)$
12. $(3x^3-x^2-x+2)(x-1)$
13. $(a^2-a-1)(a-1)$
14. $(x^3+x^2-x-4)(x-4)$
15. $(2a^3+15a^2+5)(3a^2-1)$
16. $(2x-3)(4x^2+6x+9)$
17. $(9x^2-15x+25)(3x+5)$
18. $(x^2-x-1)(x+5)$
19. $(x^4+x^3+x^2+x+1)(x-1)$
20. $(3x^2-2x+3)(3x-3)$
21. $(x^3-x^2+1)(x^3+x^2-1)$
22. $(x^4+3x^2-1)(x^4+3x^2+1)$

What is the name of the horizontal line segment used to separate the numerator from the denominator in a common fraction?

NUM $8x^3-27$	**ER** x^3+4x^2-6x-5	**SEP** $3x^4-4x^3+4x-3$	**SEG** $12x^4+2x^3+x-3$	**VIN** $9x^3-15x^2+15x+9$
BEATS $x^8+6x^6+9x^4-1$	**US** $3x^4-4x^3+3x-2$	**TOO** $2a^5+a^3-a$	**WHO** x^3+1	**BAR** $x^4-3x^3-5x^2+16$
BAR x^4-2x^3+2x-1	**LIN** $9x^3-15x^2+15x-9$	**XING** $6a^5+45a^4-2a^3-5$	**MEN** x^5-1	**CU** $x^8+6x^6-9x^4-1$
ME $x^6-x^4+2x^2-1$	**EUM** $27x^3+125$	**BAR** x^3+2x^2+9	**KNOWS** a^3+1	**SET** x^3-1
DEN $a^5+a^4+2a^2-1$	**LUM** $6a^3-13a^2+8a-3$	**MENT** a^3-2a^2+1	**FRAT** x^4-1	**LUM** x^4+1

Making Practice Fun 37 Name_____

Polynomials—Special Products

FACTS ABOUT SEA DWELLERS

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Multiply.

1. $3x(x + 2) = 3x^2 + 6x$ R
2. $-2x(3x - 4)$
3. $-3x^3(2x^2 - x + 1)$
4. $-4x^3(-x + 1)$
5. $-2(-3x^2 - 8x - 4)$
6. $9x(x^3 + 3x^2 - 3x - 9)$
7. $-5x(x^3 - 10x)$
8. $2(x^4 + 4x^3 + 4x + 16)$
9. $2x(x^3 + 3x^2 - 4x - 12)$
10. $4x(x^3 + 2x^2 - 9x - 18)$
11. $(x^2 - 1)(3x^3 + 15x)$
12. $(x - 3)(x + 4)$
13. $(x^2 - 1)(x + 1)$
14. $(6x + 2)(3x + 2)$
15. $(3x - 5)(x - 5)$
16. $(2x + 4)(3x + 2)$
17. $(x^2 + 3x)(9x^2 - 27)$
18. $\frac{1}{2}x^2(-10x^2 + 100)$
19. $(x - \frac{1}{2})(x + \frac{1}{2})$
20. $(2x + 8)(x^3 + 4)$
21. $(x^2 - 4)(2x^2 + 6x)$
22. $3x(x^4 + 4x^2 - 5)$
23. $x^2(-6x^3 + 3x^2 - 3x)$
24. $(3x + 1)(6x + 4)$
25. $(x + 2)(6x + 4)$
26. $(9x - 3)(x^2 + 1)$
27. $(x + 2)(x^3 - 2)$

Code Letter	Answer
A	$4x^4 + 8x^3 - 36x^2 - 72x$
B	$3x^2 - 20x + 25$
C	$18x^2 + 18x + 4$
D	$9x^4 + 27x^3 - 27x^2 - 27x$
E	$3x^5 + 12x^3 - 15x$
F	$-6x^2 + 8x$
G	$x^2 - \frac{1}{4}$
H	$-6x^5 + 3x^4 - 3x^3$
I	$9x^3 - 3x^2 + 9x - 3$
J	$-6x^2 + 10x$
K	$x^2 + x - 12$
L	$x^4 + 2x^3 - 2x - 4$
M	$2x^4 + 6x^3 - 8x^2 - 24x$
N	$6x^2 + 16x + 8$
O	$9x^4 + 27x^3 - 27x^2 - 81x$
P	$2x^4 + 8x^3 + 8x + 32$
Q	$4x^4 + 8x^3 - 36x^2 + 72x$
R	$3x^2 + 6x$
S	$-5x^4 + 50x^2$
T	$x^3 + x^2 - x - 1$
U	$x^3 - x^2 + x - 1$
V	$x^2 - \frac{1}{2}$
W	$x^2 + \frac{1}{4}$
X	$4x^4 + 4x^3$
Y	$4x^4 - 4x^3$
Z	$x^2 - x + 12$

This sea dweller must filter out a ton of water before gaining 3 grams body weight:

$\overline{18}\ \overline{20}\ \overline{17}\ \overline{16}\ \overline{19}\ \overline{22}$

This sea dweller is almost entirely transparent:

$\overline{10}\ \overline{25}\ \overline{11}\ \overline{5}\ \overline{6}\ \overline{21}\ \overline{22}\quad \overline{18}\ \overline{3}\ \overline{\underset{R}{1}}\ \overline{26}\ \overline{9}\ \overline{8}$

The venom of this sea dweller is poisonous:

$\overline{18}\ \overline{13}\ \overline{6}\ \overline{16}\ \overline{22}\ \overline{2}\ \overline{26}\ \overline{7}\ \overline{23}$

This sea dweller weighs over a ton and can leap 5 m out of the water:

$\overline{9}\ \overline{10}\ \overline{25}\ \overline{13}\ \overline{10}\quad \overline{\underset{R}{1}}\ \overline{10}\ \overline{4}$

These sea dwellers hang upside down and kick food into their mouths:

$\overline{19}\ \overline{6}\ \overline{17}\ \overline{7}\ \overline{22}\ \overline{25}\ \overline{11}\ \overline{24}\ \overline{12}\quad \overline{15}\ \overline{10}\ \overline{\underset{R}{1}}\ \overline{25}\ \overline{10}\ \overline{14}\ \overline{27}\ \overline{11}\ \overline{7}$

Making Practice Fun 38 Name_____

Polynomials—More Special Products

DIAGRAM PUZZLE

1. Work Exercise A1 and Exercise B1.
2. Draw a straight line segment connecting these two answers.
3. Continue with Exercise A2 and Exercise B2, and so on.

Exercises A

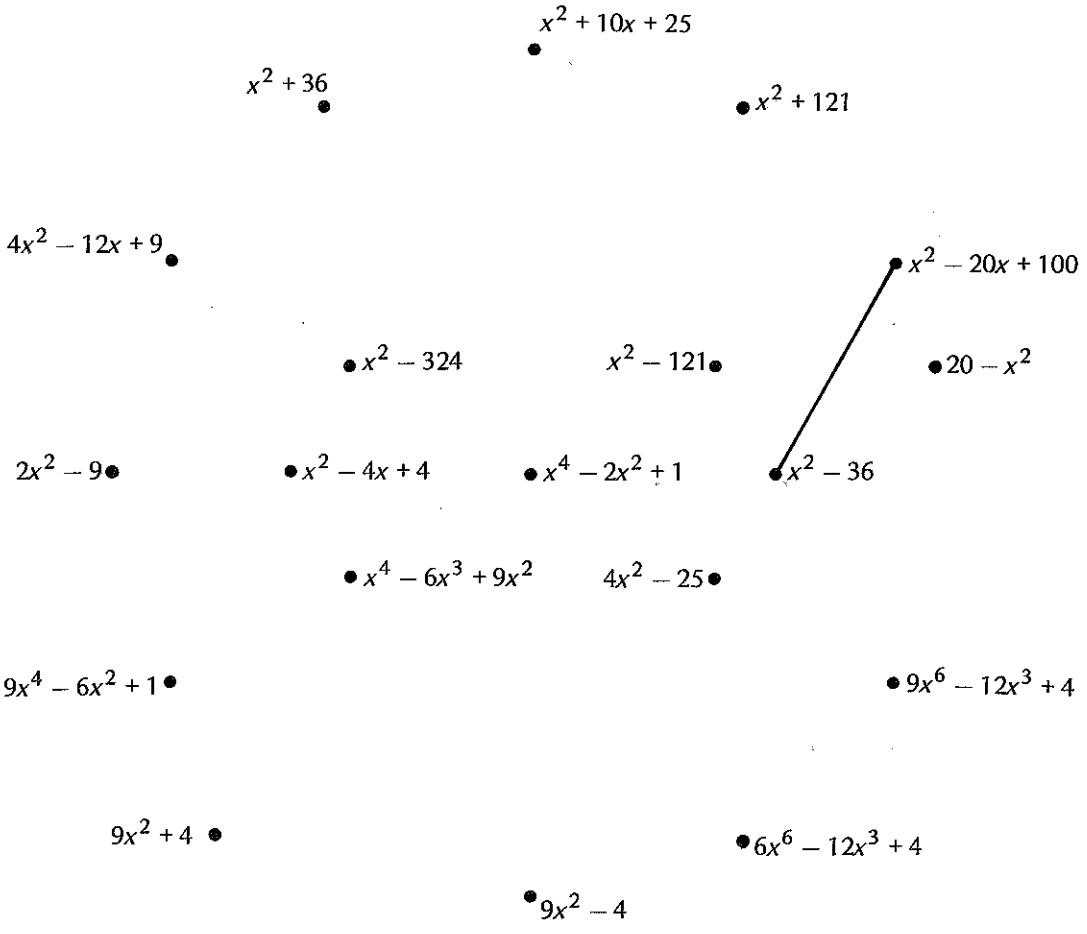
Multiply.

1. $(x-6)(x+6) = x^2 - 36$
2. $(3x-2)(3x+2)$
3. $(x^2-1)^2$
4. $(x+5)^2$
5. $(2x-3)^2$
6. $(x+5)(x+5)$
7. $(3x-x^2)^2$
8. $(x+18)(x-18)$
9. $(10-x)(10-x)$
10. $(-1+x^2)(-1+x^2)$

Exercises B

Multiply.

1. $(x-10)^2 = x^2 - 20x + 100$
2. $(2x-5)(2x+5)$
3. $(3x^2-1)^2$
4. $(1-3x^2)^2$
5. $(2-x)^2$
6. $(2-3x^3)(2-3x^3)$
7. $(3x+2)(3x-2)$
8. $(2x-3)(2x-3)$
9. $(x-11)(x+11)$
10. $(2-3x^3)^2$



Making Practice Fun 39 Name_____

Polynomials and Factoring—Common Factors, Factoring by Grouping

INFORMATION TIME

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

Factor.

1. $x^2 - 6x = x(x - 6)$
2. $x^2 + 10x$
3. $2x^2 - 6x$
4. $3x^2 + 15x$
5. $4x^2 - 8x - 10$
6. $3x^2 - 12x + 21$
7. $9x^3 - 18x^2 + 45x$
8. $3x^4 - 2x^3 + x$
9. $25x^7 - 15x^4 + 35x^2$
10. $-18 + 36x$
11. $3x^5 - 4x^4 + 7x^3$
12. $14x^8 + 28x^4 - 7x$
13. $x^{11} - x^{22}$
14. $\frac{2}{5}x^5 - \frac{1}{5}x^6 - \frac{4}{5}x^3$
15. $\frac{3}{7}x^8 - \frac{2}{7}x^7 + \frac{5}{7}x^6$
16. $-\frac{9}{5}x^{12} - \frac{6}{5}x^8 - \frac{3}{5}x^4$
17. $x^{15} - x^{10} + x^9$
18. $18x^6 - 42x^5 - 36x^2$
19. $-14x^5 - 21x^4 - 35x^2$
20. $-12x^6 + 4x^7 - 8$
21. $51x^3 - 3x$
22. $32x^3 + 35x^2 - 25x$
23. $x^2 + 2x + 5x + 10$
24. $x^2 + 6x + 2x + 12$
25. $x^2 + 8x - 3x - 24$
26. $3x^2 + 12x - 2x - 8$
27. $35x^2 + 14x - 15x - 6$
28. $18x^2 + 6x - 21x - 7$

Which two cities are almost 16,000 km apart?

SAN FRANCISCO $7x(2x^7 + 4x^3 - 1)$	**TOKYO** $2x(x - 3)$	**HONG KONG** $6x^2(3x^4 - 7x^3 - 6)$	**MELBOURNE** $(6x + 7)(3x - 1)$	**LONDON** $x(x + 10)$
PARIS $(x + 8)(x - 3)$	**ONTARIO** $3(x^2 - 4x + 7)$	**SYDNEY** $\frac{1}{5}x^3(2x^2 - x^3 - 4)$	**OSLO** $x^3(3x^2 - 4x + 7)$	**SINGAPORE** $3(17x^2 - 1)$
BAGDAD $x^{11}(1 - x^{11})$	**BUENOS AIRES** $-7x^2(2x^3 + 3x^2 + 5)$	**SANTIAGO** $9x(x^2 - 2x + 5)$	**LIMA** $4(-3x^6 + x^7 - 2)$	**RIO DE JANEIRO** $18(-1 + 2x)$
BERLIN $\frac{1}{5}x^3(2x^2 + x^3 + 4)$	**LAS VEGAS** $x(32x^2 + 35x - 25)$	**QUEBEC** $(3x - 2)(x + 4)$	**HONOLULU** $3x(x + 5)$	**NEW YORK** $(x + 6)(x + 2)$
VANCOUVER $x(x - 6)$	**MADRID** $2(2x^2 - 4x - 5)$	**ROME** $\frac{1}{7}x^6(3x^2 - 2x + 5)$	**LISBON** $(6x - 7)(3x + 1)$	**MOSCOW** $x^9(x^6 - x + 1)$
PEKING $5x^2(5x^5 - 3x^2 + 7)$	**WARSAW** $(x + 2)(x + 5)$	**WASHINGTON** $-\frac{3}{5}x^4(3x^8 + 2x^4 + 1)$	**MEXICO CITY** $x(3x^3 - 2x^2 + 1)$	**CARACAS** $(7x - 3)(5x + 2)$

Making Practice Fun 40 Name_____

Polynomials and Factoring—Factoring Trinomials I

INFORMATION TIME

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

Factor.

1. $x^2 + 7x + 12 = (x + 3)(x + 4)$
2. $x^2 + 9x + 8$
3. $x^2 - 3x - 10$
4. $y^2 + 12y + 27$
5. $y^2 - 16y - 36$
6. $y^2 - 16y + 55$
7. $x^2 - 11x + 30$
8. $x^2 - 13x - 30$
9. $x^2 - 13x + 30$
10. $x^2 - \frac{2}{3}x + \frac{1}{9}$
11. $x^2 - \frac{2}{14}x + \frac{1}{49}$
12. $x^4 + 6x^2 + 9$
13. $x^4 + 9x^2 + 14$
14. $y^2 + 0.8y + 0.15$
15. $3x^2 + 5x - 2$
16. $2x^2 - 9x + 4$
17. $21x^2 + 29x - 10$
18. $12x^2 + 25x + 12$
19. $10y^2 - 49y + 18$
20. $11x^2 + 9x - 2$
21. $64x^2 + 80x + 25$
22. $7y^2 + 22y - 24$
23. $9y^2 - 41y - 20$
24. $12x^2 + 17x - 40$
25. $18y^2 - 9y - 20$
26. $12x^2 + 47x + 11$
27. $10x^2 + 99x - 10$
28. $24y^2 + 52y + 24$
29. $2x^2 - 13x - 45$

When did U. S. astronaut Neil Armstrong walk on the moon?

March 5, 1971 $(2x - 1)(x - 4)$	**Feb 4, 1964** $(7y - 6)(y + 4)$	**July 5, 1969** $(y + 9)(y + 3)$	**Dec 2, 1968** $(6y + 5)(3y - 4)$	**July 8, 1969** $(x + 8)(x + 1)$	**July 19, 1969** $(x - \frac{1}{7})(x - \frac{1}{7})$
Aug 9, 1969 $(x + 4)(x + 3)$	**Oct 4, 1968** $(12y + 8)(2y + 3)$	**Jan 5, 1970** $(x - 9)(2x + 5)$	**July 4, 1970** $(3x - 1)(x + 2)$	**Oct 3, 1962** $(x - 6)(x - 5)$	**May 1, 1963** $(x^2 + 7)(x^2 + 2)$
Nov 9, 1968 $(2y - 9)(5y - 2)$	**July 10, 1970** $(y - 11)(y - 5)$	**July 10, 1969** $(9y + 4)(y - 5)$	**Aug 19, 1969** $(y - 18)(y + 2)$	**July 20, 1969** $(3x - 11)(4x - 1)$	**May 5, 1968** $(3x + 11)(4x + 1)$
July 25, 1969 $(x - 15)(x + 2)$	**Sept 23, 1972** $(3x + 4)(4x + 3)$	**July 22, 1969** $(10x - 1)(x + 10)$	**Sept 17, 1973** $(x - \frac{1}{3})(x - \frac{1}{3})$	**June 12, 1969** $(x - 5)(x + 2)$	**June 11, 1968** $(7x - 2)(3x + 5)$
Nov 30, 1969 $(11x - 2)(x + 1)$	**Aug 11, 1958** $(y + 0.3)(y + 0.5)$	**Aug 24, 1969** $(4x - 5)(3x + 8)$	**Feb 11, 1972** $(x - 10)(x - 3)$	**Feb 14, 1971** $(x^2 + 3)(x^2 + 3)$	**Oct 1, 1969** $(8x + 5)(8x + 5)$

Making Practice Fun 41 Name _____

Polynomials and Factoring—Factoring Trinomials II

DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

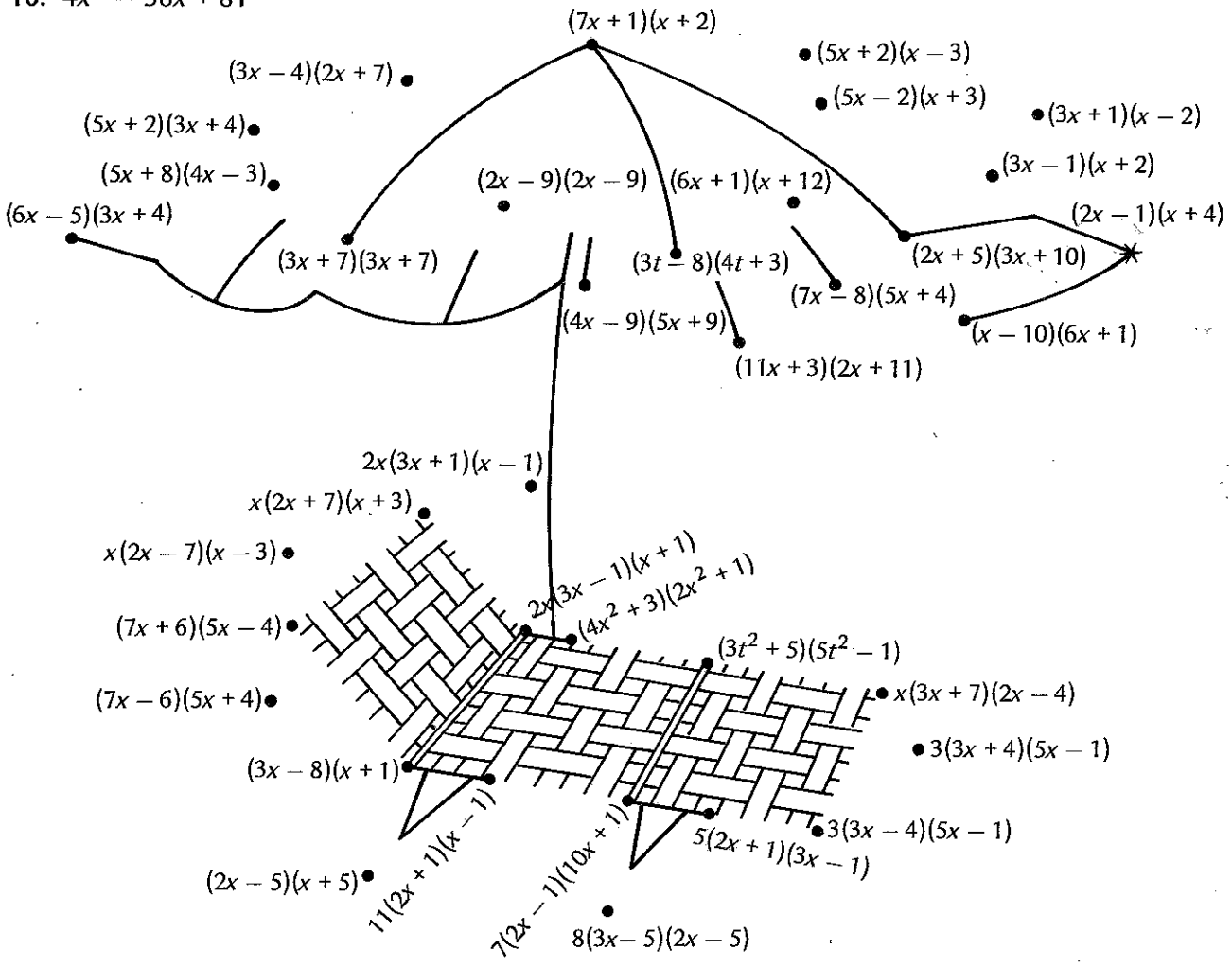
Exercises

Factor.

1. $2x^2 + 7x - 4$
$(2x - 1)(x + 4)$
2. $3x^2 + 5x - 2$
3. $5x^2 + 13x - 6$
4. $7x^2 + 15x + 2$
5. $6x^2 + 13x - 28$
6. $15x^2 + 26x + 8$
7. $18x^2 + 9x - 20$
8. $20x^2 + 17x - 24$
9. $9x^2 + 42x + 49$
10. $4x^2 - 36x + 81$

11. $12t^2 - 23t - 24$
12. $12 + 73x + 6x^2$
13. $50 + 35x + 6x^2$
14. $6x^2 - 59x - 10$
15. $35x^2 - 12x - 32$
16. $22x^2 + 127x + 33$
17. $20x^2 - 9x - 81$
18. $8x^4 + 10x^2 + 3$
19. $15t^4 + 22t^2 - 5$
20. $6x^3 + 2x^2 - 28x$

21. $45x^2 - 69x + 12$
22. $30x^2 + 5x - 5$
23. $48x^2 - 200x + 200$
24. $140x^2 - 56x - 7$
25. $22x^2 - 11x - 11$
26. $2x^2 + 5x - 25$
27. $3x^2 - 5x - 8$
28. $35x^2 + 2x - 24$
29. $2x^3 + 13x^2 + 21x$
30. $6x^3 + 4x^2 - 2x$



Making Practice Fun 42 Name _____

Polynomials and Factoring—Factoring Squares of Binomials

FACTS ABOUT INVENTORS

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Factor.

1. $x^2 - 12x + 36 = (x - 6)^2$ V
2. $x^2 - 18x + 81$
3. $x^2 + 16x + 64$
4. $x^2 - 6x + 9$
5. $x^2 - 20x + 100$
6. $x^2 + 22x + 121$
7. $x^2 + 8x + 16$
8. $2x^2 - 20x + 50$
9. $5x^2 - 10x + 5$
10. $2x^2 + 28x + 98$
11. $\frac{1}{4}x^2 - x + 1$
12. $18x^2 + 24x + 8$
13. $12x^2 - 12x + 3$
14. $49 - 28x + 4x^2$
15. $25 - 70x + 49x^2$
16. $49x^2 + 70x + 25$
17. $x^8 - 2x^4 + 1$
18. $x^{10} - 4x^5 + 4$
19. $160x^2 - 240x + 90$
20. $18x^2 - 120x + 200$
21. $\frac{1}{9}y^2 - \frac{1}{3}y + \frac{1}{4}$
22. $\frac{1}{9}x^6 - \frac{2}{3}x^3 + 1$
23. $\frac{1}{9}x^6 + \frac{2}{3}x^3 + 1$
24. $54x^2 - 72x + 24$

Code Letter	Answer
A	$(2x - 7)^2$
B	$2(3x - 10)^2$
C	$2(x + 7)^2$
D	$(x^4 - 1)^2$
E	$(7x - 5)^2$
F	$2(3x + 2)^2$
G	$(x + 4)^2$
H	$(\frac{1}{3}x^3 + 1)^2$
I	$(\frac{1}{3}y - \frac{1}{2})^2$
J	$(x - 9)^2$
K	$6(3x - 2)^2$
L	$(\frac{1}{2}x - 1)^2$
M	$(\frac{1}{3}x^3 - 1)^2$
N	$(7x + 5)^2$
O	$(x + 8)^2$
P	$(x + 11)^2$
Q	$9(6x - 2)^2$
R	$(x^5 - 2)^2$
S	$(x - 10)^2$
T	$5(x - 1)^2$
U	$2(x - 5)^2$
V	$(x - 6)^2$
W	$(x - 3)^2$
X	$(\frac{1}{3}x^6 - 1)^2$
Y	$3(2x - 1)^2$
Z	$10(4x - 3)^2$

Who invented the . . .

balloon? $\frac{\quad}{22}\ \frac{\quad}{3}\ \frac{\quad}{16}\ \frac{\quad}{9}\ \frac{\quad}{7}\ \frac{\quad}{3}\ \frac{\quad}{11}\ \frac{\quad}{12}\ \frac{\quad}{21}\ \frac{\quad}{15}\ \frac{\quad}{18}$, 1783 (France)

revolver? $\frac{\quad}{10}\ \frac{\quad}{3}\ \frac{\quad}{11}\ \frac{\quad}{9}$, 1835 (U. S.)

adding machine? $\frac{\quad}{6}\ \frac{\quad}{14}\ \frac{\quad}{5}\ \frac{\quad}{10}\ \frac{\quad}{14}\ \frac{\quad}{11}$, 1642 (France)

automobile engine? $\frac{\quad}{20}\ \frac{\quad}{15}\ \frac{\quad}{16}\ \frac{\quad}{19}$, 1879 (Germany)

helicopter? $\frac{\quad}{5}\ \frac{\quad}{21}\ \frac{\quad}{24}\ \frac{\quad}{3}\ \frac{\quad}{18}\ \frac{\quad}{5}\ \frac{\quad}{24}\ \frac{\quad}{13}$, 1939 (U. S.)

electric locomotive? $\frac{V}{1}\ \frac{\quad}{14}\ \frac{\quad}{21}\ \frac{\quad}{11}$, 1851 (U. S.)

lawn mower? $\frac{\quad}{23}\ \frac{\quad}{21}\ \frac{\quad}{11}\ \frac{\quad}{11}\ \frac{\quad}{5}$, 1868 (U. S.)

icemaking machine? $\frac{\quad}{7}\ \frac{\quad}{3}\ \frac{\quad}{18}\ \frac{\quad}{18}\ \frac{\quad}{21}\ \frac{\quad}{15}$, 1851 (U. S.)

military tank? $\frac{\quad}{5}\ \frac{\quad}{4}\ \frac{\quad}{21}\ \frac{\quad}{16}\ \frac{\quad}{9}\ \frac{\quad}{3}\ \frac{\quad}{16}$, 1914 (England)

zipper? $\frac{\quad}{2}\ \frac{\quad}{8}\ \frac{\quad}{17}\ \frac{\quad}{5}\ \frac{\quad}{3}\ \frac{\quad}{16}$, 1891 (U. S.)

Making Practice Fun 43 Name _____

Polynomials and Factoring—Factoring Differences of Squares

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

Factor.

1. $x^2 - 16 = (x - 4)(x + 4)$
2. $x^2 - 25$
3. $x^2 - 1$
4. $9x^2 - 25$
5. $64y^2 - 49$
6. $100a^4 - 9$
7. $12x^2 - 75$
8. $45x^2 - 5$
9. $x^6 - 4x^2$
10. $25y^{10} - 169$
11. $y^5 - y^3$
12. $5x^4 - 45$
13. $7x^4 - 112$
14. $18x^3 - 242x$
15. $x^4 - 81$
16. $x^{12} - 16$
17. $\frac{1}{9} - x^2$
18. $\frac{1}{49}x^2 - \frac{1}{25}$
19. $1 - y^4$
20. $a^7 - 25a^3$
21. $1 - y^{20}$
22. $\frac{9}{25} - y^2$
23. $28a^2 - 63$
24. $3x^{26} - 48$
25. $8x^6 - 2x^2$
26. $125x^5 - 45x$
27. $x^{100} - y^2$
28. $25 - y^6$
29. $200x^2 - 18$
30. $1000x^4 - 10$

P $(x-1)(x+1)$	**R** $(5y^5-13)(5y^5+13)$	**I** $5(3x-1)(3x+1)$	**S** $(x^3-2)(x^3+2)(x^6+4)$	**M** $(x^{10}-y)(x^{10}+y)$
P $7(2a-3)(2a+3)$	**L** $(\frac{3}{5}-y)(\frac{3}{5}+y)$	**A** $(10a^2-3)(10a^2+3)$	**N** $3(x^{13}-4)(x^{13}+4)$	**E** $(\frac{1}{7}x-\frac{1}{25})(\frac{1}{7}x+1)$
P $(x^{50}-y)(x^{50}+y)$	**I** $2(10x-3)(10x+3)$	**T** $10(10x^2-1)(10x^2+1)$	**C** $5x(5x^2-3)(5x^2+3)$	**H** $(5-y^3)(5+y^3)$
P $2x(3x-11)(3x+11)$	**O** $a^3(a^2-5)(a^2+5)$	**I** $7(x-2)(x+2)(x^2+4)$	**N** $y^3(y-1)(y+1)$	**T** $a^3(a^2-5)(a^2-5)$
P $(8y-7)(8y+7)$	**H** $2x^2(2x^2-1)(2x^2+1)$	**A** $(x-4)(x+4)$	**S** $(\frac{1}{3}-x)(\frac{1}{3}+x)$	**E** $x^2(x^2-2)(x-2)$
P $3(2x-5)(2x+5)$	**O** $(1-y)(1+y)(1+y^2)$	**L** $5(x^2-3)(x^2+3)$	**A** $(x-3)(x+3)(x^2+9)$	**R** $(x-3)(x+3)(x^2-9)$
P $(1-y^5)(1+y^5)(1+y^{10})$	**R** $(3x-5)(3x+5)$	**I** $(\frac{1}{7}x-\frac{1}{5})(\frac{1}{7}x+\frac{1}{5})$	**M** $x^2(x^2-2)(x^2+2)$	**E** $(x-5)(x+5)$

Making Practice Fun 44 Name_____

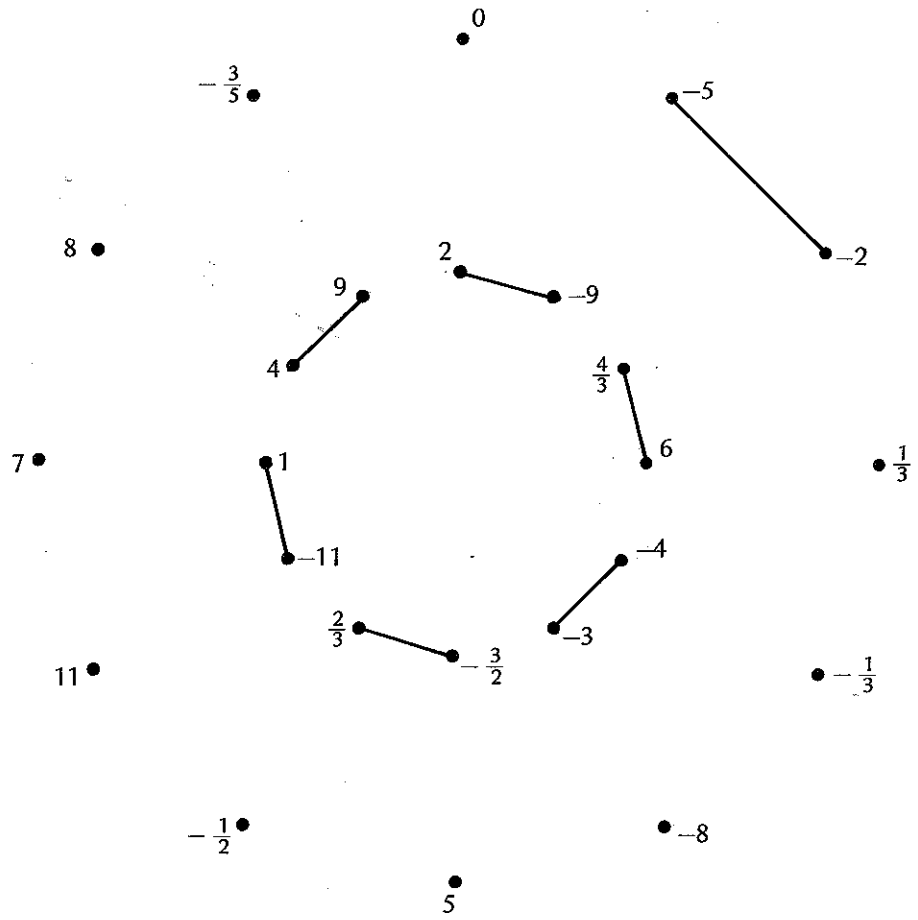
Polynomials and Factoring—Solving Equations by Factoring

DIAGRAM PUZZLE

1. Work each exercise by finding the two solutions to the equation.
2. Connect the answers to each other.

Exercises

1. $x^2 + 7x + 10 = 0$ $-2, -5$
2. $x^2 + 11x + 24 = 0$
3. $x^2 - 8x + 7 = 0$
4. $x^2 - 11x + 18 = 0$
5. $x^2 + 3x - 40 = 0$
6. $x^2 - 2x - 24 = 0$
7. $x^2 - 121 = 0$
8. $2x^2 - 7x - 15 = 0$
9. $3x^2 + 2x = 8$
10. $x^2 - 15x = -56$
11. $6x^2 + 2x = 3x + 2$
12. $3x^2 + 10x + 10 = -13x + 46$
13. $x^2 = 2x$
14. $5x^2 - 42x = 27$
15. $x(x - 8) = 4(x - 8)$
16. $2x(x + 6) = 3(x - 3)$
17. $10x^2 - 50x + 40 = 0$
18. $4x^2 - 42x - 22 = 0$
19. $5x^2 = -3x$
20. $x^2 - \frac{1}{9} = 0$
21. $6x^2 + 26x = -8$
22. $-3x^2 - 31x + 22 = 0$
23. $-3x^2 + 19x - 6 = 0$
24. $100x^2 + 1400x + 4500 = 0$



Name_____

Polynomials and Factoring—Solving Problems

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

1. If 11 is added to the square of a number, the result is 60. Find the number. 7, −7

2. If 23 is added to the square of a number, the result is 104. Find the number.

3. Twenty more than the square of a number is twelve times the number. Find the number.

4. If 40 is subtracted from the square of a number, the result is three times the number. Find the number.

5. The product of two consecutive odd integers is 255. Find the integers.

6. The length of a rectangle is 5 m greater than the width. The area of the rectangle is 84 m^2. Find the length and width of the rectangle.

7. The length of a rectangle is 6 cm greater than the width. The area of the rectangle is 72 cm^2. Find the length and the width.

8. The base of a triangle is 10 m greater than the height. The area is 12 m^2. Find the height and base.

9. The base of a triangle is 16 cm greater than the height. The area is 40 cm^2. Find the height and base.

10. The height of a triangle is 5 cm less than the base. The area is 42 cm^2. Find the height and base.

11. The base of a triangle is 9 cm less than the height. The area is 35 cm^2. Find the height and base.

12. If the sides of a square are lengthened by 4 m, the area becomes 100 m^2. Find the length of a side of the original square.

You must read what is there and what is not there.

I 15, 17	**N** 8, 5	**O** 12, 3	**W** 7, −7	**A** 12, 7	**Y** 10, 2
T 14, 5	**O** 2, 12	**W** 12, 7	**O** 6	**R** 12, 6	**K** 4, 20
L 8, −5	**L** 8	 7, −10	**C** 4, 22	**K** 16, 17	**E** 9, −9

Making Practice Fun 46 Name _____

Polynomials and Factoring—Differences of Squares, Completing the Square

DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Factor.

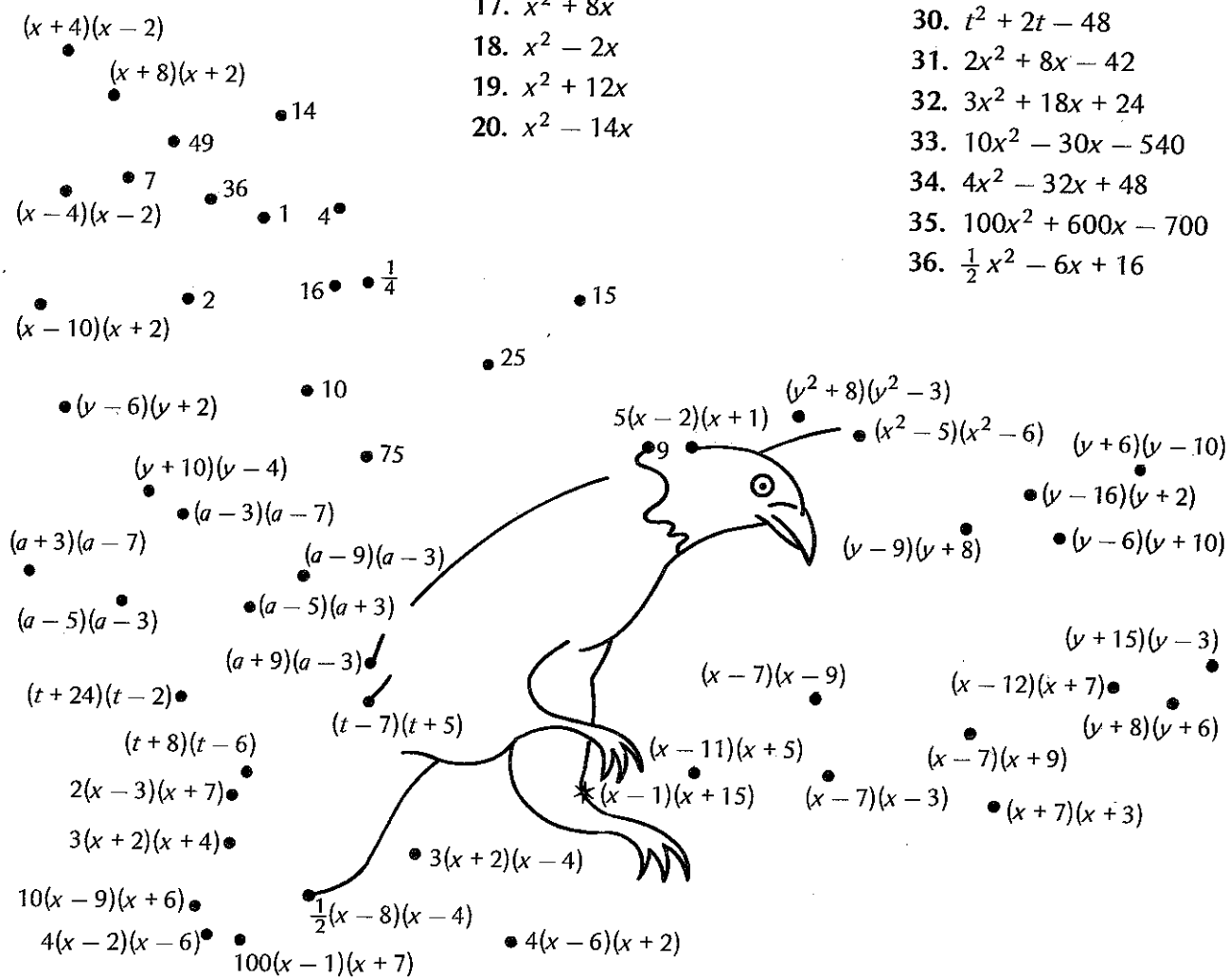
1. $x^2 + 14x + 27 - 42$
   $= (x - 1)(x + 15)$
2. $x^2 - 6x + 11 - 66$
3. $x^2 - 10x - 39 + 60$
4. $x^2 + 2x - 44 - 19$
5. $x^2 - 5x - 150 + 66$
6. $y^2 + 14y + 95 - 47$
7. $y^2 + 12y - 100 + 55$
8. $y^2 - y + 2 - 74$
9. $y^2 + 4y - 9 - 51$
10. $y^2 - 14y + 7 - 39$
11. $x^4 - 11x^2 - 40 + 70$
12. $y^4 + 5y^2 - 40 + 16$
13. $5x^2 - 5x - 23 + 13$

What must be added to make this the square of a binomial?

14. $x^2 + 6x$
15. $x^2 - 10x$
16. $x^2 - x$
17. $x^2 + 8x$
18. $x^2 - 2x$
19. $x^2 + 12x$
20. $x^2 - 14x$

Factor by completing the square.

21. $x^2 + 10x + 16$
22. $x^2 - 6x + 8$
23. $x^2 - 8x - 20$
24. $y^2 - 4y - 12$
25. $y^2 + 6y - 40$
26. $a^2 - 10a + 21$
27. $a^2 - 2a - 15$
28. $a^2 + 6a - 27$
29. $t^2 - 2t - 35$
30. $t^2 + 2t - 48$
31. $2x^2 + 8x - 42$
32. $3x^2 + 18x + 24$
33. $10x^2 - 30x - 540$
34. $4x^2 - 32x + 48$
35. $100x^2 + 600x - 700$
36. $\frac{1}{2}x^2 - 6x + 16$

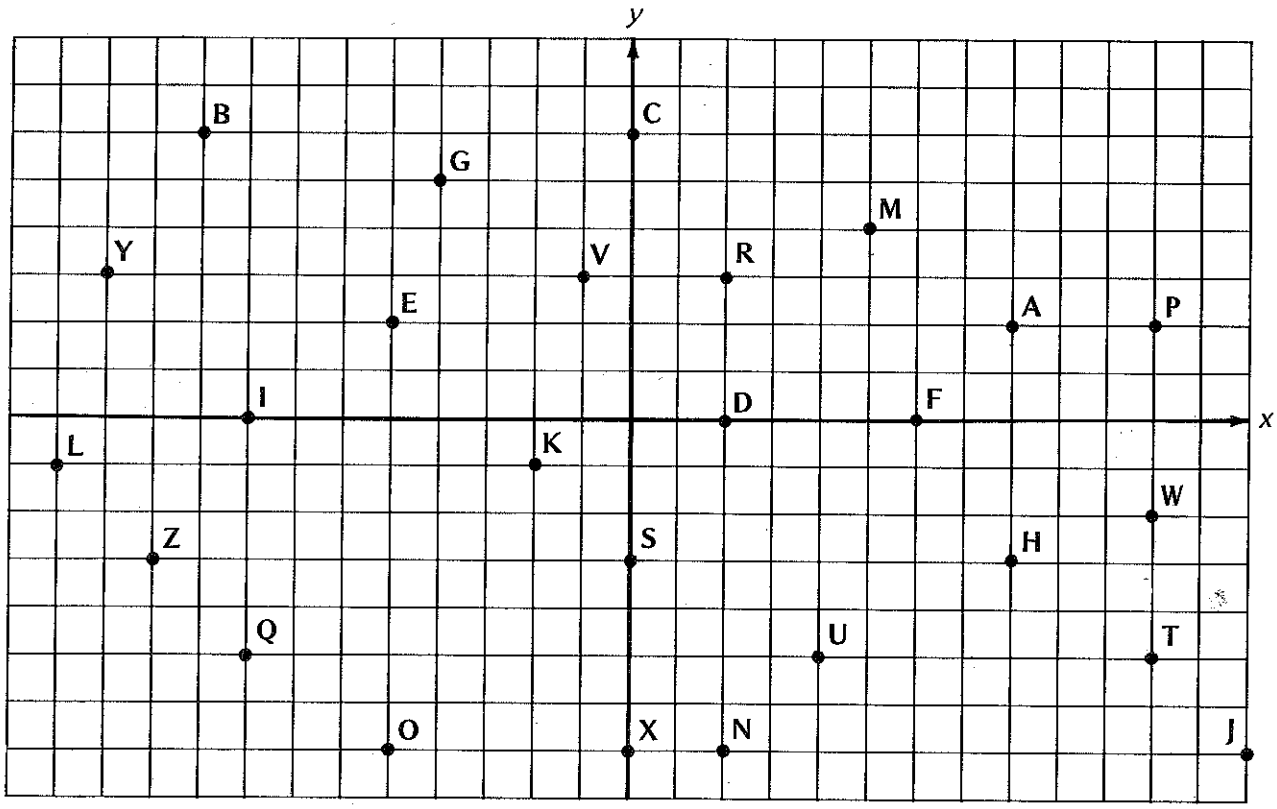


Making Practice Fun 47 Name _____

Graphs and Linear Equations—Finding Coordinates

FACTS ABOUT PI

1. For each ordered pair in the puzzle, find the associated point on the grid.
2. Write this letter in the blank.



Count the letters in each word to find pi to eleven digits.

H							H
(8, –3)	(–5, –7)	(11, –2)	(–8, 0)	(11, –2)	(–8, 0)	(0, –3)	(8, –3)

(–8, 0)	(0, 6)	(–5, –7)	(4, –5)	(–12, –1)	(2, 0)

(2, 3)	(–5, 2)	(0, 6)	(–5, –7)	(–12, –1)	(–12, –1)	(–5, 2)	(0, 6)	(11, –5)	

(–8, 0)	(2, –7)	(0, –3)	(–8, 0)	(5, 4)	(11, 2)	(–12, –1)	(–5, 2)

(11, –5)	(–5, 2)	(2, 3)	(5, 4)	(0, –3)	(–8, 0)	(11, –5)	(0, –3)

					!
(–1, 3)	(8, 2)	(–12, –1)	(4, –5)	(–5, 2)	

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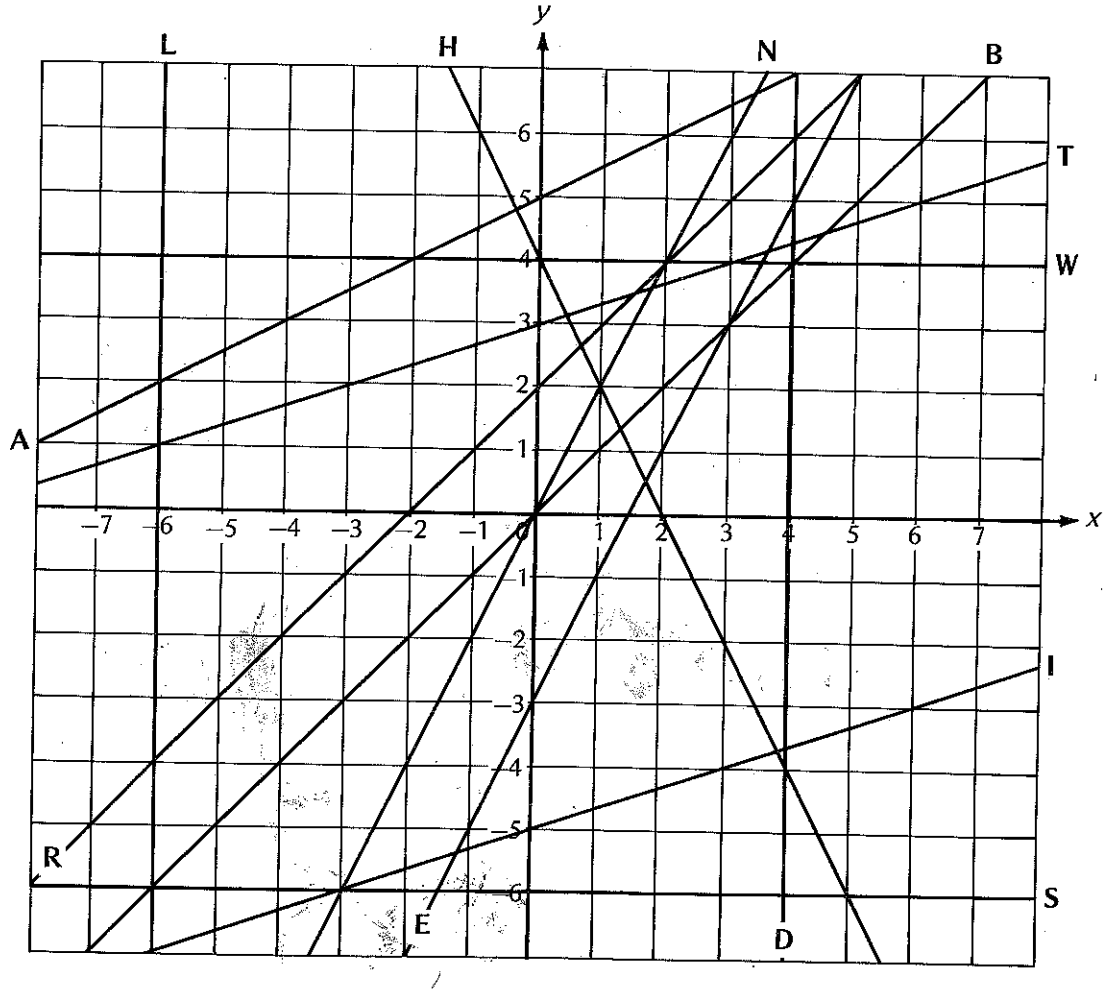
Graphs and Linear Equations—Identifying Graphs and Equations

MESSAGE IN CODE

1. Find the graph for each equation.
2. Write the letter in the blank. You may use the same letter several times.

R	$y = x + 2$
_____	$y = 2x - 3$
_____	$y = \frac{1}{2}x + 5$
_____	$x = 4$
_____	$y = x$
_____	$3y - 6x + 9 = 0$
_____	$y = \frac{1}{3}x + 3$
_____	$y = 4$
_____	$y - 2x = -3$
_____	$\frac{y}{2} = x - \frac{3}{2}$
_____	$3y = 6x$
_____	$3y - x = 9$
_____	$2y + 4x = 8$
_____	$5y - 10x = -15$
_____	$x = -6$
_____	$y = \frac{1}{3}x - 5$
_____	$y - 2x = 0$
_____	$2y = 4x - 6$
_____	$y = -6$



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Graphs and Linear Equations—Recognizing Linear Equations

HIDDEN MESSAGE

1. Determine whether or not each equation is linear.
2. Shade the linear equations.
3. Read the message in the unshaded blocks.

I $3x - 2y = 6$	**S** $4x + 5y = -11$	**E** $x - y = 0$	**E** $13y - 5w = 91$	**A** $2p^2 - 9q = 1$
Y $3x^2 - 2y = 6$	**H** $2xy - 5 = 11$	**O** $6x + y = -9$	**M** $yx = 2 + 3$	**U** $x = 2y$
O $-x - xy = 2$	**N** $18x + y = 0$	**L** $3p - 4q = 12$	**Y** $3 = x$	**S** $x = -3$
C $2^2x - 3^2y = 1$	**A** $2x^2 - 3y^2 = 1$	**N** $4 = x + y$	**E** $7 = x + y^2$	**L** $8 = xy - 2$
A $8 - x - y = 9$	**N** $28 - x = y^2$	**I** $x^2 - 6 = y + 4x$	**Y** $y + 7x = -3$	**I** $2xy - 4 = y + 1$
U $7x - 2y = xy - 1$	**D** $3xy = 4$	**P** $3x + y = 4$	**O** $8x - 7y = 29$	**W** $1000x + \frac{1}{5}y = 11$
R $2x + 3 = 9xy$	**A** $5 - 7x + 2y = 0$	**N** $x^2 - y = 0$	**I** $x - y = -24$	**N** $36x^2 - 36y^2 = 1$
E $4x - 7y = \frac{1}{xy}$	**I** $12x + 9y = 12 + 9$	**G** $6x - 4xy = 5$	**O** $-5 - x = 5y$	**E** $-xy = -23$

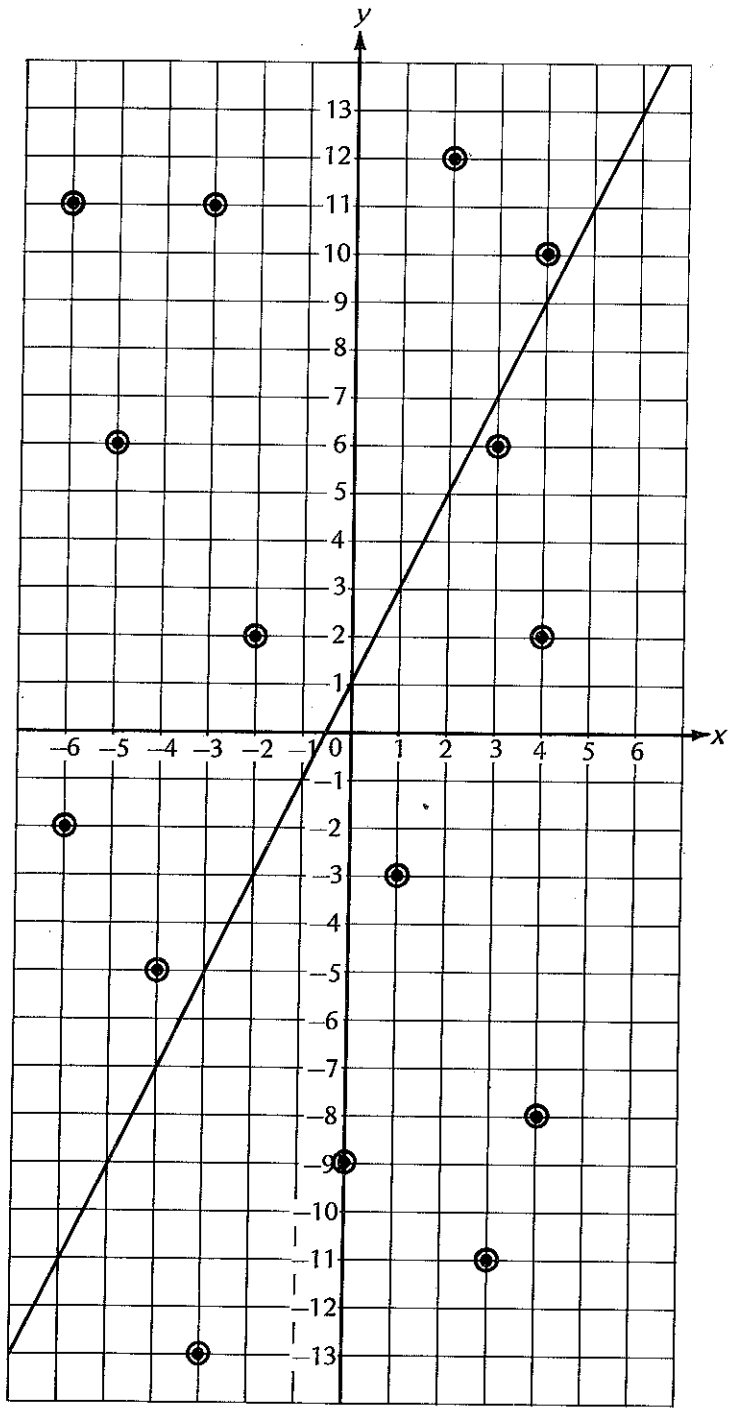
Making Practice Fun 50

Graphing Linear Equations

Name_____

HIT OR MISS

1. Graph each equation.
2. If the line passes through the dot of the object ball, it's a hit; if not, it's a miss.
3. Record your hits and misses in the table below.



The cue ball is aimed at the object ball and shot along the straight line of the equation. How many object balls can you hit?

Shot Number	Equation	Hit	Miss
1	$y = 2x + 1$		✓
2	$y = -3x$		
3	$y = 4$		
4	$y = x - 5$		
5	$y = -x$		
6	$x = 5$		
7	$x = -5$		
8	$4y = 3x - 4$		
9	$4y - 2x = 32$		
10	$6y + 5x = 3$		
11	$y = 9$		
12	$y = -11$		
13	$6y - 2x = 30$		
14	$y - 8 = -2x$		
15	$x = 0$		

Name_____

Graphs and Linear Equations—Solving Problems

DIAGRAM PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.
3. Draw in line segments to complete the cube.

Exercises

1. A taxi charges 75 cents initial fee plus 11 cents each kilometer. Find the cost of a 280 km trip. $31.55

2. At a math contest, students began with 44 points, and were given 12 points for each problem correctly solved. How many points would a student have if he solved 38 problems correctly?

3. A certain 50 cm spring will stretch (in cm) $\frac{1}{5}$ the weight (in kg) attached to it. How long will the spring be if a 35 kg weight is attached to it?

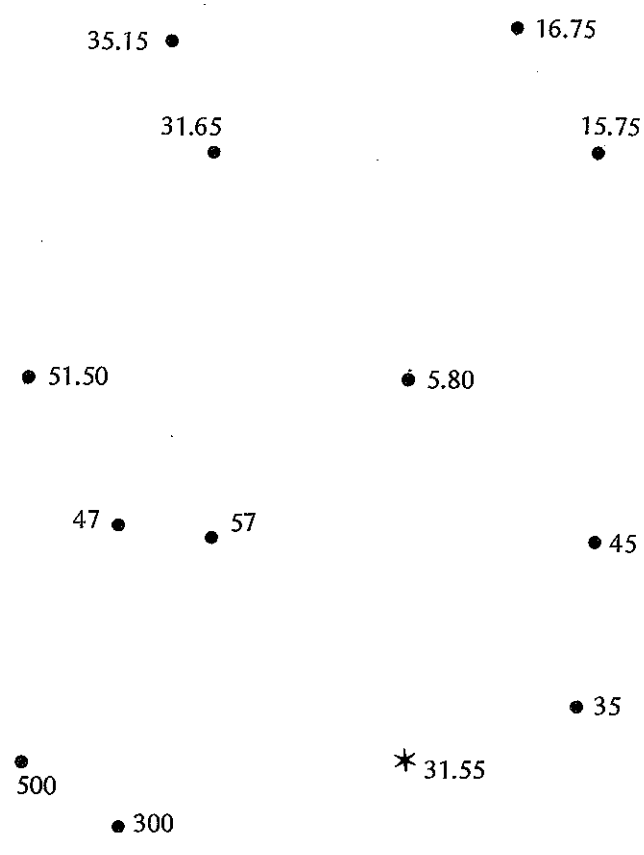
4. A certain 32 cm spring will stretch (in cm) one-half the weight (in kg) attached to it. How long will the spring be if a 26 kg weight is attached to it?

5. Mrs. Karr Pett rented a shampooer. The charge was $1.75 per hour plus $5.25 for the shampoo. How much did she owe if she used the shampooer for 6 hours?

6. A lumber yard charges a fixed fee of $1.40 plus an additional 55 cents for each piece of wood it cuts. What would it cost to cut 55 pieces of wood?

7. The charge to call Tokyo, Japan is $8.50 for the first three minutes, plus $2.15 for each additional minute. What would a 23-minute call cost?

8. The Smash Hit parking lot on Broadway charges 85 cents for the first hour plus 55 cents for each additional hour. Find the cost of parking for 9 hours.



Name_____

Graphs and Linear Equations—Slope

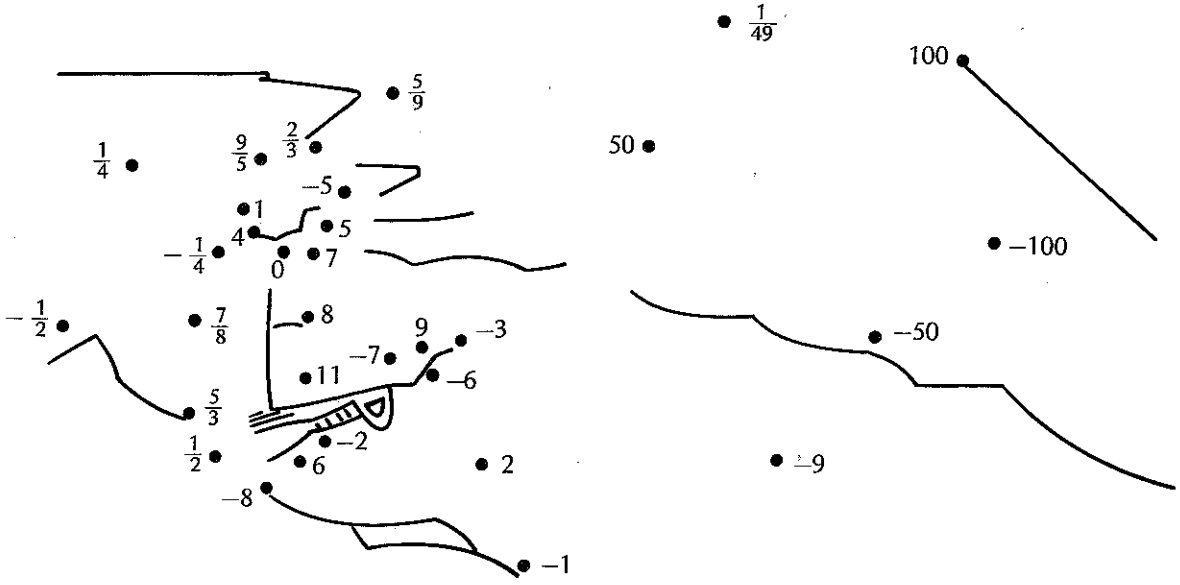
DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Find the slope of the line joining each pair of points.

1. (3, 4) and (4, 7)
   slope = 3
2. (4, 0) and (6, −2)
3. (0, 9) and (1, 11)
4. (7, −8) and (−3, 12)
5. (−1, −1) and (1, 11)
6. (2, −3) and (1, 5)
7. (3, 4) and (5, 5)
8. (0, 0) and (3, 5)
9. (−3, −1) and (5, 6)
10. (4, 0) and (−4, 2)
11. (3, −9) and (5, −1)
12. (7, −8) and (8, −7)
13. $(\frac{1}{3}, \frac{1}{5})$ and $(\frac{2}{3}, \frac{4}{5})$
14. $(-\frac{1}{4}, \frac{4}{9})$ and $(\frac{1}{4}, \frac{7}{9})$
15. $(-\frac{3}{7}, 9)$ and $(\frac{4}{7}, 4)$
16. (2, 3) and (3, 8)
17. (1, −4) and (2, 3)
18. (9, 3) and (4, 3)
19. (−3, −11) and (−1, 5)
20. (6, 11) and (5, 0)
21. (2, 4) and (3, −3)
22. (−2, −3) and (−1, 6)
23. (0, 10) and (4, −2)
24. (49, −50) and (50, 50)
25. (8, −12) and (4, 12)



Making Practice Fun 53 Name_____

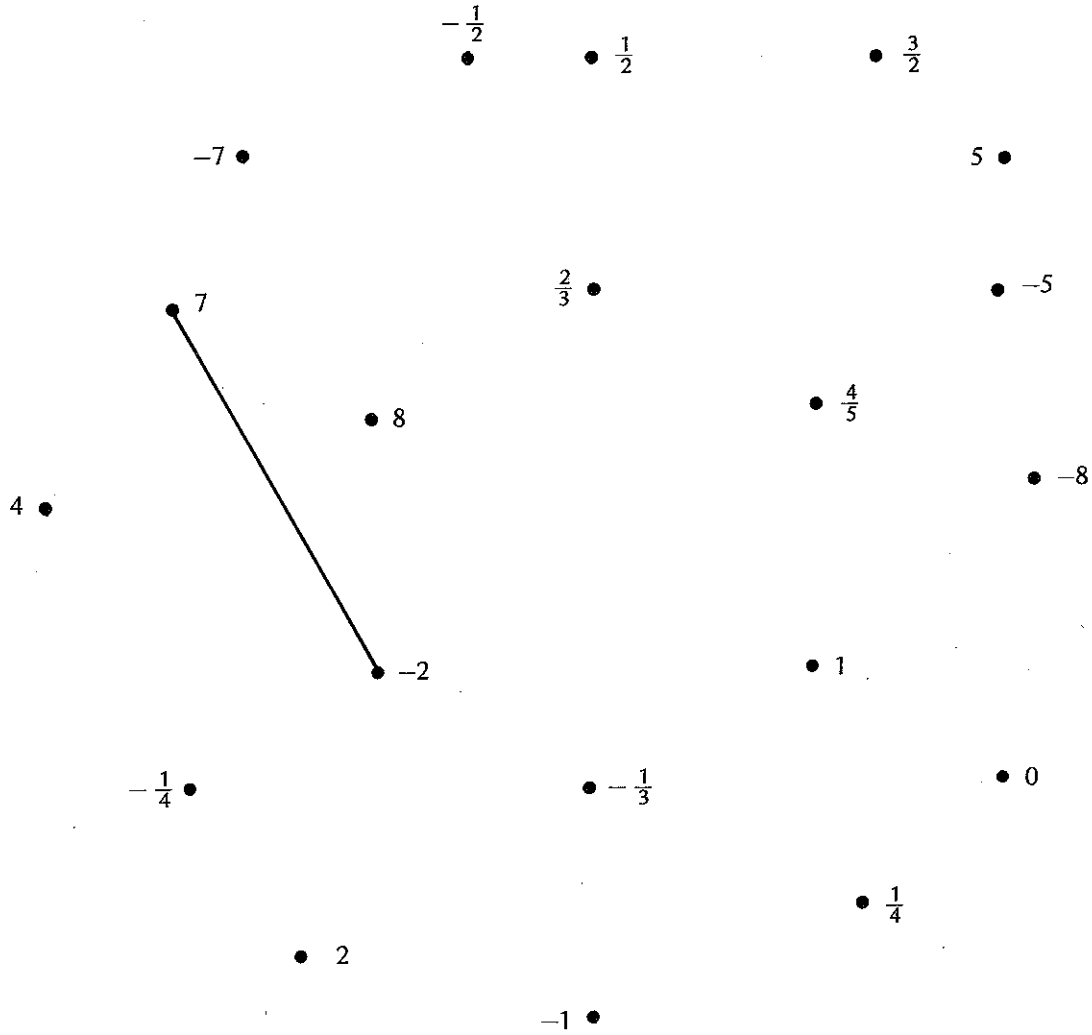
Finding the Slope and y-Intercept of a Line from an Equation

DIAGRAM PUZZLE

1. Find the slope and y-intercept for each line.
2. Locate those answers on the diagram and connect them to each other.

Exercises

1. $y = -2x + 7$ Slope -2; y-intercept 7
2. $y = \frac{2}{3}x - 5$
3. $y = x + 8$
4. $6y = 3x + 4$
5. $-3 - 12y = 4x$
6. $y - x = 0$
7. $5y + 25 = 4x$
8. $3y + 3x + 1 = 0$
9. $20y + 40x = -5$
10. $6y - 3 = 48x$
11. $5y - 4 = 0$
12. $y + x - 1 = 0$
13. $\frac{1}{2}x + \frac{3}{2}y = 1$
14. $\frac{4}{7} + \frac{1}{2}x = \frac{1}{14}y$
15. $5y - 4x + 10 = 0$



Making Practice Fun 54 Name_____

Systems of Equations and Graphs—Solving Using Graphs

MESSAGE IN CODE

1. Solve each system of equations graphically.
2. Find the letter at their intersection point.
3. Write this letter in the blank beside each exercise.

Exercises

I 1. $y = x + 6$, $y = -x + 4$ $(-1, 5)$

____ 2. $y = -\frac{1}{3}x + 5$, $y = \frac{4}{3}x$

____ 3. $y = \frac{5}{2}x + 3$, $y = \frac{3}{2}x + 5$

____ 4. $y = \frac{3}{4}x + 1$, $y = \frac{1}{2}x + 2$

____ 5. $y = -x$, $y = -\frac{1}{4}x + 3$

____ 6. $y = -\frac{1}{4}x + 5$, $y = -\frac{3}{4}x + 7$

____ 7. $y = \frac{1}{4}x + 1$, $y = -\frac{1}{2}x - 2$

____ 8. $y = 2x$, $y = \frac{3}{2}x - 1$

____ 9. $y = -x + 2$, $y = \frac{1}{3}x - 2$

____ 10. $y = 2$, $x = -3$

____ 11. $y = -\frac{3}{4}x + 1$, $y = -\frac{1}{2}x + 2$

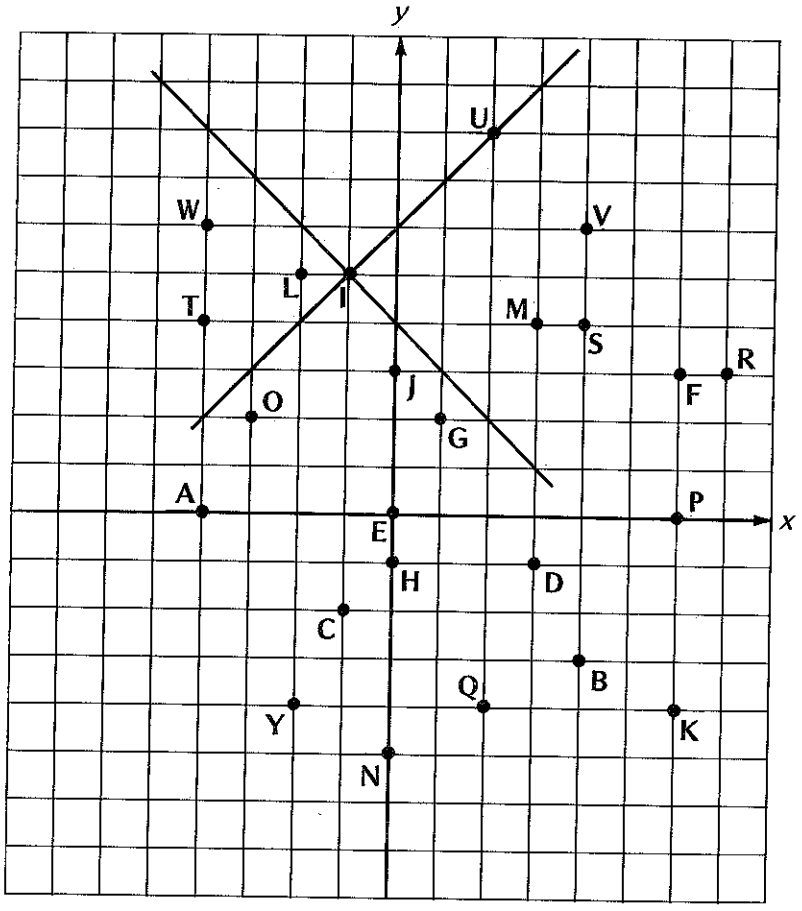
____ 12. $y = 4$, $x = 4$

____ 13. $y = \frac{1}{3}x + 1$, $y = \frac{7}{6}x - 4$

____ 14. $y = -7x - 2$, $y = -5x$

____ 15. $y = x - 5$, $y = -x - 5$

____ 16. $y = x$, $y = -x$



Systems of Equations and Graphs—Solving by the Substitution Method

DIAGRAM PUZZLE

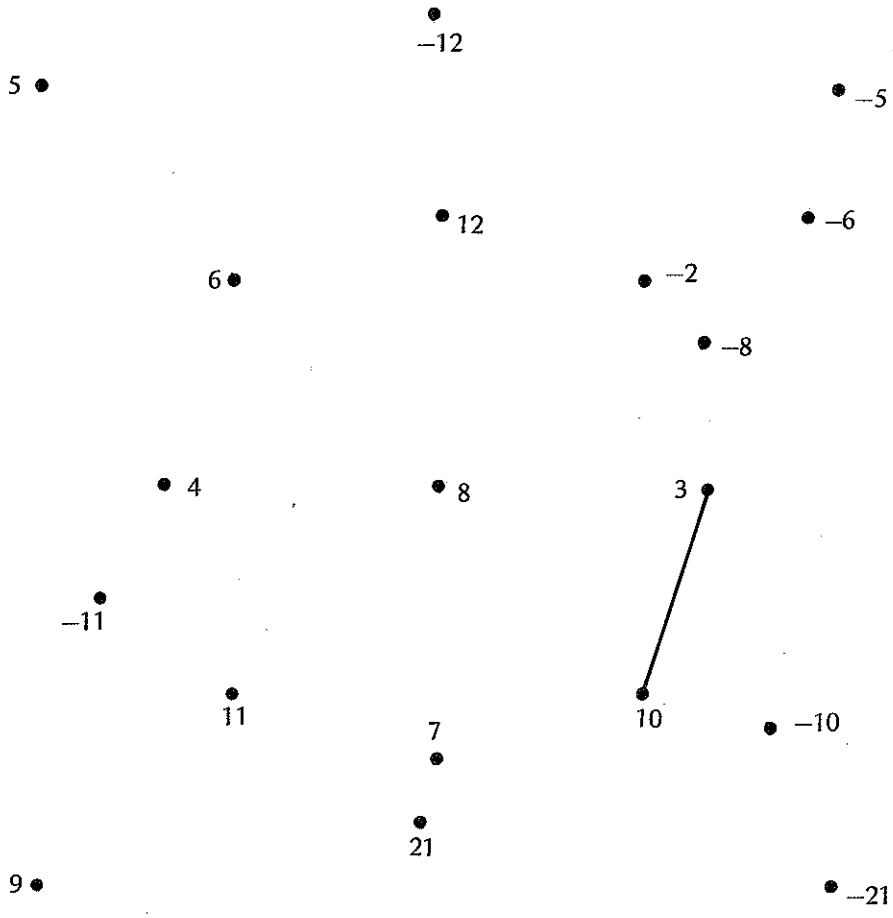
1. Solve each system of equations by substitution.
2. Connect the x-value of the answer to the y-value of the answer.

Exercises

Solve by the substitution method.

1. $x + y = 13$
   $y = 2x + 4$ (3, 10)
2. $x + y = 14$
   $y = x + 4$
3. $y = x - 7$
   $x + y = 15$
4. $y = x - 10$
   $x + 2y = 4$
5. $y = 2x$
   $3y + 2x = 48$
6. $x = y + 8$
   $4x + 2y = 2$
7. $m = p + 7$
   $3m - 5p = 25$
8. $m = 2l - 12$
   $5m + 6l = 100$
9. $10R - 7t = 0$
   $t = 24 - 2R$
10. $q = -3r$
    $5r + q = 14$
11. $x - y = 2$
    $x + y = 14$
12. $x - y = 2$
    $x + y = 16$
13. $x - y = -24$
    $x + 8y = 3$
14. $x - 2y = 8$
    $2x + y = -9$
15. $2A + 5B = -4$
    $-3A + B = -11$
16. $2A - B = 3$
    $-A + B = 4$
17. $3B - 2A = 11$
    $A + B = 17$
18. $4A + B = -1$
    $6A + 2B = -12$
19. $3A - 2B = -25$
    $A + 2B = 5$
20. $x + y = 1$
    $y - x = 11$
21. $2x - 3y = 0$
    $3x - 4y = 3$
22. $x - y = 30$
    $3x + y = 6$
23. $2x + y = 14$
    $x - y = 1$
24. $x - 4y = -1$
    $x + 3y = -36$

Can you find a square? an octagon? a parallelogram? a right triangle? an obtuse triangle?



Making Practice Fun 56 Name_____

Systems of Equations and Graphs—Solving Using the Addition Method

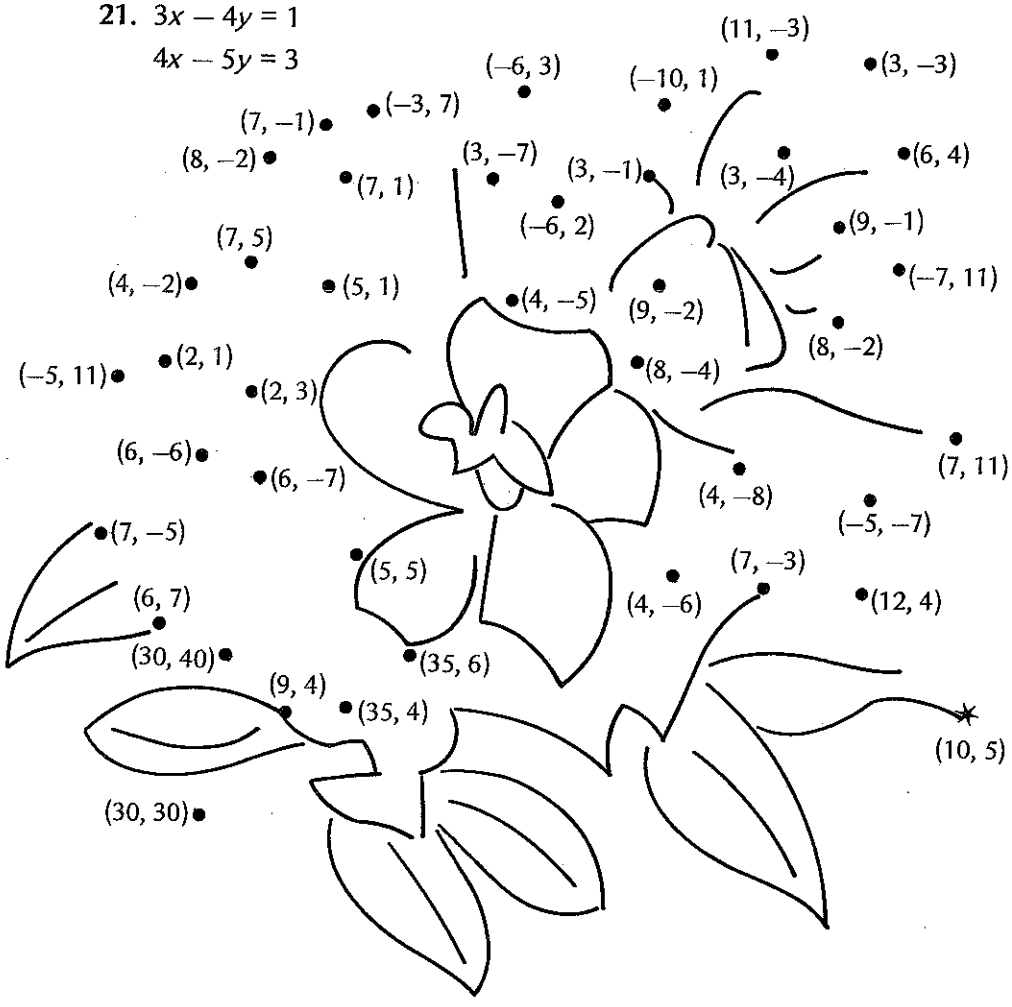
DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Solve by the addition method.

1. $x + y = 15$, $x - y = 5$ (10, 5)
2. $x + y = 16$, $x - y = 8$
3. $x + y = 4$, $x - y = 10$
4. $x + y = -4$, $2x - y = 16$
5. $x + y = -12$, $3x - y = -8$
6. $4x - y = 17$, $x + y = 18$
7. $2x + 3y = 10$, $x - 3y = 14$
8. $4x - 2y = 38$, $x + 2y = 7$
9. $5x - 3y = 18$, $3x + 3y = 30$
10. $4x - 5y = 32$, $8x + 5y = 4$
11. $2x + 6y = 4$, $x - 6y = 29$
12. $x + y = -9$, $x - y = -11$
13. $7x - 8y = 29$, $4x + 8y = 4$
14. $2x + 5y = -2$, $-x - 5y = -4$
15. $-x - y = 1$, $2x + y = 3$
16. $-x - y = 4$, $2x - y = 13$
17. $4x + 2y = 2$, $5x + 2y = -1$
18. $x - 2y = 9$, $x + 3y = 4$
19. $x + 5y = -2$, $x - 2y = 12$
20. $3x - 2y = 13$, $2x + 3y = 13$
21. $3x - 4y = 1$, $4x - 5y = 3$
22. $7x + 2y = 24$, $x + 2y = 0$
23. $3x - 7y = -1$, $2x + y = 5$
24. $x + y = 6$, $2x + y = 1$
25. $2x + y = 6$, $x + y = 0$
26. $3x + 2y = 11$, $4x + 5y = 3$
27. $3x - 2y = 4$, $2x - y = 5$
28. $1.2x + 2.4y = 18$, $x + y = 10$
29. $0.2x + 0.3y = 18$, $0.4x - 0.3y = 0$
30. $\frac{3}{5}x - \frac{1}{2}y = 19$, $-\frac{2}{5}x - \frac{1}{2}y = -16$
31. $\frac{2}{3}x + \frac{1}{4}y = 7$, $\frac{2}{3}x - \frac{3}{4}y = 3$



Name_____

Systems of Equations and Graphs—Solving Problems

CROSS NUMBER PUZZLE

1. Work each exercise.
2. Write the answer in the correct squares.

Across

2. The sum of two numbers is 26. Their difference is 4. Find the smaller number. 11

5. The sum of two numbers is 716. Their difference is 308. Find the larger number.

7. The sum of two numbers is 400. One of them is 20 more than the other. Find the larger number.

9. The sum of two numbers is 21. Three times the larger is four times the smaller. Find the larger number.

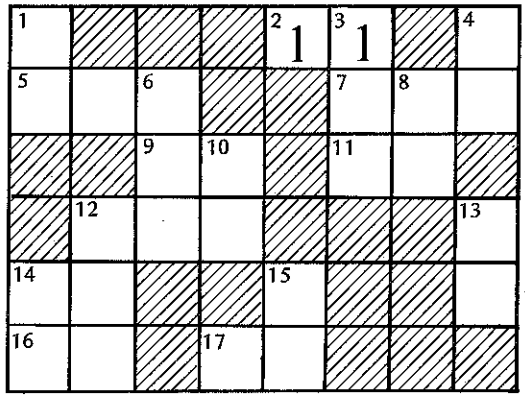
11. The perimeter of a rectangle is 74. The length is 5 more than the width. Find the width.

12. Two angles are supplementary. One of them is three times the other. Find the measure of the larger angle.

14. Two angles are complementary. The difference of their measures is 24°. Find the measure of the larger angle.

16. The difference between two numbers is 26. The larger is 30 less than twice the smaller. Find the smaller number.

17. There are 38 students in an English class. There are 8 more boys than girls. How many girls are there?



Down

1. The sum of two numbers is 23. One of them is 7 more than the other. Find the larger number.

3. The difference between two numbers is 80. Three times the smaller minus 2 is the larger number. Find the larger number.

4. The sum of two numbers is 64. Their difference is 16. Find the larger number.

6. The sum of two numbers is 226. Their difference is 200. Find the larger number.

8. The difference between two numbers is 5. The larger is 6 less than twice the smaller. Find the larger number.

10. The perimeter of a rectangle is 160 m. The length is 30 m more than the width. Find the width of the rectangle.

12. Two angles are supplementary. The difference of their measures is 172°. Find the measure of the larger angle.

13. Two angles are complementary. One of them is 4 times the other. Find the measure of the smaller angle.

14. Two angles are complementary. The larger is 15° less than twice the smaller. Find the measure of the larger angle.

15. Nadine is two years younger than Mark. The sum of their ages is 28. How old is Nadine?

Name_____

Systems of Equations and Graphs—Solving Motion Problems

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

1. A train travels due north at 65 km/h. Six hours later, another train leaves the same station traveling due north on a parallel track, and travels at 95 km/h. In how many hours will the second train overtake the first? 13

2. How far did the trains in Exercise 1 travel before the second train overtook the first?

3. A robber leaves the scene of his crime in a car traveling due west on Highway 80 at 110 km/h. An hour later, a patrol car leaves the same site in pursuit at 160 km/h. How long will it take the patrol car to overtake the robber's car?

4. A ferryboat travels between two towns. The trip takes 2 hours traveling with a current of 4 km/h. The return trip takes 3 hours (against the current). Find the speed of the boat in still water.

5. How far apart are the two towns in Exercise 4?

6. An airplane makes a trip in 4 hours with a tail wind of 30 km/h. The return trip (against the wind) requires 7 hours. Find the speed of the airplane in still air.

7. How far did the plane in Exercise 6 travel (one way)?

8. A jet traveled 1920 km in 6 hours flying against a headwind. The return trip (with the wind) took $3\frac{1}{3}$ hours. Find the speed of the jet in still air.

9. What was the speed of the wind in Exercise 8?

SLOW	MOTION	OBJECTS	CAUSE	PROBLEMS
20	25	560	1235	$2\frac{3}{5}$
MAKE	WORK	HARD	MANY	SOME
112	$2\frac{1}{5}$	110	48	46
STUDENTS	PUPILS	DIZZY	ILL	TIRED
526	128	580	448	13

Making Practice Fun 59 Name_____

Systems of Equations and Graphs—Solving Coin and Mixture Problems

INFORMATION TIME

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

1. A collection of dimes and nickels is worth \$4.70. There are 60 coins in all. How many of each are there? 34 dimes, 26 nickels
2. A collection of dimes and nickels is worth \$8.40. There are 106 coins in all. How many of each are there?
3. A collection of dimes and quarters is worth worth \$19. There are 91 coins in all. How many of each are there?
4. A collection of quarters and nickels is worth \$13.50. There are 78 coins in all. How many of each are there?
5. A collection of half dollars and quarters is worth \$26. There are 65 coins in all. How many of each are there?
6. Nicholas and Daimon emptied their piggy banks and found they had \$11, all in nickels and dimes. How many of each did they have if they had 156 coins?
7. Tickets to the Fashion Show were \$2.50 for adults, and \$1 for students. The receipts were \$674 for 302 tickets sold. How many adults and how many students attended?
8. There were 512 people at the Talent Show. Admission was \$1.25 for adults, and 50 ¢ for children. The receipts were \$406.75. How many of each attended?
9. Mike's house payments rose from \$295 to \$310 per month. In the past 12 months, he paid \$3615. How many payments at each rate did he make?
10. Al Gee had a 40% algicide solution and a 70% algicide solution. How much of each should he use to make 100 g of a 52% solution?
11. Solution X is 20% alcohol, and solution Y is 80% alcohol. How much of each should be used to make 100 / of a 50% solution?
12. Solution K is 30% alcohol and solution W is 60%. How much of each should be used to make 300 / of a 40% solution?
13. A tank contains 20 / of a solution that is 60% acid. How much water should be added to dilute it to 50%?
14. A tub contains 300 / of a 32% salt solution. How much water must be added to reduce it to a 20% solution?
15. A vat contains 100 / of a 40% acid solution. How much acid must be added to increase the acidity to 60%?
16. How much acid must be added to 40 ml of a 20% solution to increase it to a 28% solution?

What is the name and depth of the deepest ocean?

ATLANTIC 39, 26	INDIAN 4	ARCTIC 34, 26	5 km 200, 100	1 km 311, 201	2 km 48, 30
ARCTIC 66, 25	PACIFIC 40, 60	8 km 7, 5	11 km 8, 4	2 km 62, 44	$\frac{1}{2}$ km 180
PACIFIC 60, 40	9 km 92, 64	PACIFIC 50	$\frac{3}{4}$ km 248, 54	ATLANTIC $4\frac{4}{9}$	4 km 50, 50

Making Practice Fun 60

Name _____

Inequalities—Solving by Using the Addition Principle

FACTS ABOUT BIG FISH

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Solve for x.

1. $x + 8 > 3$ $x > -5$ I
2. $x + 6 > 11$
3. $x + 2 < -9$
4. $x - 4 \leqslant -20$
5. $x + 7 \geqslant -12$
6. $2x + 3 < x + 7$
7. $3x + 5 \leqslant 2x + 11$
8. $4x - 5 > 3x + 7$
9. $6x - 4 \geqslant 5x - 5$
10. $12x + 32 < 11x + 30$
11. $7x + 6 < 6x + 10$
12. $9x - 9 \leqslant 8x - 25$
13. $3x + 1 > x + 13$
14. $6x - 14 \leqslant 5x - 8$
15. $3x - 2 < 2x + 2$
16. $8x + 11 \geqslant 7x + 10$
17. $2x - 9 > x - 14$
18. $x + \frac{1}{4} > \frac{1}{2}$
19. $x - \frac{1}{3} < \frac{1}{6}$
20. $4x + 24 \geqslant -52$
21. $3x + 7 \leqslant -41$
22. $5x - 100 > -70$
23. $2x - 8 \leqslant -40$
24. $5x - 83 < -63$
25. $2x + 11 < -x + 35$
26. $7x - 9 > 3x + 15$
27. $4x + 25 \leqslant 3x + 31$
28. $5x - 9 > 2x + 9$
29. $-8 + x > -2$
30. $\frac{2}{3}x - \frac{1}{2} < \frac{1}{3}$
31. $7x + \frac{1}{2} < 6x - \frac{3}{2}$
32. $4x - 6 > -x - 31$

Code Letter	Answer
A	$x \leqslant 6$
B	$x < -6$
C	$x > -6$
D	$x < 8$
E	$x \geqslant -1$
F	$x < 19$
G	$x > 5$
H	$x < -11$
I	$x > -5$
J	$x < 12$
K	$x > -12$
L	$x > 6$
M	$x > -\frac{1}{2}$
N	$x \geqslant -19$
O	$x > 12$
P	$x < \frac{1}{2}$
Q	$x < -2$
R	$x < -\frac{1}{4}$
S	$x \leqslant -16$
T	$x > \frac{4}{5}$
U	$x < 4$
V	$x > 1$
W	$x > \frac{1}{4}$
X	$x > -1$
Y	$x \leqslant 11$
Z	$x < \frac{5}{4}$

The record bonefish was caught in

$\overline{30}\ \overline{15}\ \overline{29}\ \overline{24}\ \overline{28}\ \overline{14}\ \overline{5}\ \overline{25}$ (S. Africa)

The record dolphin was caught in

$\overline{12}\ \overline{19}\ \overline{7}\ \overline{20}\ \overline{17}\ \overline{21}\ \overline{3}\quad\overline{18}\ \overline{9}\ \overline{22}\ \overline{13}\ \overline{23}$ (Bahamas)

The record swordfish was caught in

$\frac{\text{I}}{1}\ \overline{31}\ \overline{11}\ \overline{32}\ \overline{10}\ \overline{6}\ \overline{16}$ (Chile)

The record barracuda was caught in

$\overline{26}\ \overline{27}\ \overline{2}\ \overline{8}\ \overline{4}$ (Nigeria)

Making Practice Fun 61 Name _____

Inequalities—Solving by Using the Multiplication Principle

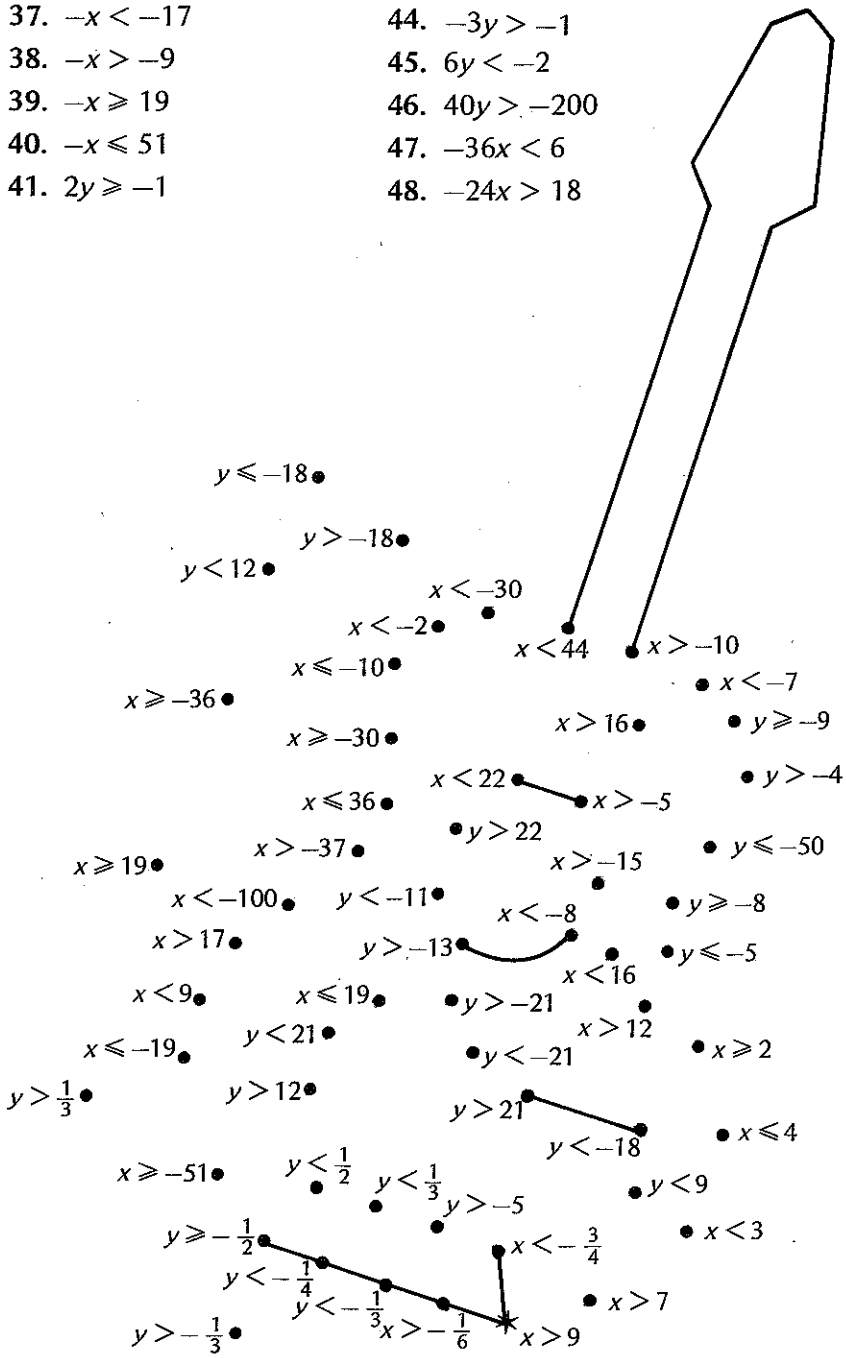
DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Solve each inequality.

1. $3x > 27$ $x > 9$
2. $4x > 28$
3. $5x < 15$
4. $7x \leq 28$
5. $6x \geq 12$
6. $3y \leq -15$
7. $8y \geq -64$
8. $10y \leq -500$
9. $13y > -52$
10. $7y \geq -63$
11. $6x < -42$
12. $5x > -50$
13. $-4x < 20$
14. $-2x < 30$
15. $-3x > 24$
16. $-6x > -96$
17. $-3x < -36$
18. $-5y > 90$
19. $-4y > -36$
20. $-2y < -24$
21. $-3y > -63$
22. $-3y < -63$
23. $-3y > 63$
24. $-3y < 63$
25. $-2y < 26$
26. $-4y > 44$
27. $-2y < -44$
28. $3x < 66$
29. $-2x > -88$
30. $-4x > 120$
31. $-7x > 14$
32. $-2x \geq 20$
33. $-3x \leq 90$
34. $-4x \geq -144$
35. $-3x < 111$
36. $-2x > 200$
37. $-x < -17$
38. $-x > -9$
39. $-x \geq 19$
40. $-x \leq 51$
41. $2y \geq -1$
42. $12y < 6$
43. $-12y > 3$
44. $-3y > -1$
45. $6y < -2$
46. $40y > -200$
47. $-36x < 6$
48. $-24x > 18$



Making Practice Fun 62 Name_____

Inequalities—Solving Using the Addition and Multiplication Principles

INFORMATION TIME

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

Solve each inequality.

1. $3 + 4x < 19 \quad x < 4$
2. $6 + 3y < 27$
3. $11 + 2x > 37$
4. $9 + 5x > 54$
5. $2y - 4 \leqslant 30$
6. $7y - 8 \leqslant 69$
7. $12x + 4 > -32$
8. $2y - 15 < 25$
9. $8 - 3y > -7$
10. $5 - 4y < -23$
11. $9 - y > 11$
12. $8x + 3 \leqslant 75$
13. $7x - 2 > -86$
14. $11x - 7 < 114$
15. $2 - 4y > -22$
16. $3 - 8y > -13$
17. $2 + 11y < -9$
18. $4 + 7x < -52$
19. $3x + 4 \leqslant 2x - 6$
20. $7x - 5 > 6x + 6$
21. $2x + 8 \leqslant x - 14$
22. $10x - 7 \geqslant 2x + 25$
23. $4x + 3 < 2x - 25$
24. $9x - 8 > 6x + 49$
25. $2 - 4x < 2x - 46$
26. $11 - 3x \leqslant -85$
27. $10 - 10x > 10$
28. $31 + 14y \leqslant 12y + 1$
29. $14 - 2y - 4y \geqslant -136$
30. $39 - 4x + 5x < 1$
31. $39 + 4x - 5x < 1$
32. $-11 - x - 2x \geqslant 88$
33. $-18 - x - x < 40$
34. $22 - 3x > -2x - 11$
35. $2y - 9 + 4y > 9y + 39$
36. $\frac{1}{2}(4x - 8) < \frac{1}{3}(3x + 9)$
37. $-\frac{1}{3}(9x + 15) > 46$
38. $-\frac{1}{4}(8x - 8) < 0$

What is the name of an eight-eyed creature with poison fangs?

TOOTHED $x > 9$	TARANTULA $x > 11$	CLAWING $y < 2$	COYOTE $x > -12$	DRAGON $y < 20$	WOLF $x > 20$	BEETLE $y \leqslant 11$	SPIDER $x > 0$
EIGHT $x < 0$	CROOKED $x > -29$	EYED $x \geqslant 4$	FANGED $x < -38$	MONSTER $x < -8$	SNAKE $x \geqslant 32$	SPIDER $x < 11$	TRAP $y < 5$
LIZARD $y > 7$	LIP $y \leqslant -15$	SPIDER $x < -17$	TARANTULA $x < -14$	OCTOPUS $y < -16$	URCHIN $y < 7$	CRAB $x < 4$	FISH $y \leqslant 25$
VAMPIRE $x \leqslant -10$	BAT $x \leqslant -22$	SPIDER $x > -3$	OCTOPUS $x > 1$	GREEN $x \leqslant -33$	SEA $x > 19$	MONSTER $x < 33$	DWELLER $y < -1$
BLOOD $x > 13$	THIRSTY $y < 6$	FANGED $x > 8$	LEOPARD $y < -2$	BLUE $x \leqslant 9$	TAIL $x > 38$	SPHINX $x < 7$	SPIDER $y \leqslant 17$

Making Practice Fun 63

Name_____

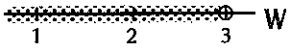
Graphing Inequalities in One Variable

SECRET MESSAGE

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Graph each inequality.

1. $x < 3$ 

2. $x > 4$
3. $x \leqslant 1$
4. $y < 8$
5. $y \geqslant 0$
6. $x \leqslant 2$
7. $y \geqslant -4$
8. $x > -11$
9. $y < \frac{1}{2}$
10. $x > -\frac{1}{2}$
11. $x + 4 < 7$
12. $x - 5 \geqslant -11$
13. $x + 8 \leqslant 0$
14. $2x + 5 > 27$
15. $7x - 6 \leqslant 36$
16. $5x + 6 \leqslant 11$
17. $2x + 9 < x + 17$
18. $3x + 4 > 2x - 7$
19. $7x - 5 \leqslant 4x - 2$
20. $4x + 12 \leqslant 2x + 14$
21. $5x + 8 > 3x - 14$
22. $3x - 1 \leqslant -3x + 5$
23. $7x - 11 \leqslant 2x + 4$
24. $6x + 9 < 12$
25. $4x - 8 \geqslant -8$
26. $2x + 11 \leqslant x + 3$
27. $8x - 5 \leqslant 3x + 5$
28. $2x + 23 \geqslant -2x - 1$
29. $3x \geqslant 0$
30. $5x + 18 > 2x - 15$
31. $4x - 9 > -11$
32. $2x + 8 \geqslant x + 2$
33. $x + 10 > -x - 12$
34. $10x - 5 < 0$
35. $32x - 7 \geqslant 19x - 7$
36. $2x - 8 \leqslant x - 5$
37. $|x| \leqslant 2$
38. $5x - 2 > 4x + 2$
39. $|x| < 3$
40. $|x| \geqslant 5$
41. $6x - 5 \leqslant -2x + 3$
42. $2x - 7 < x + 1$
43. $7x + 8 \geqslant 4x - 10$
44. $3x - 5 < 2x - 2$

Code Letter	Answer
A	10 11 12
B	−5 0 5
C	−5 0 5
D	−7 −6 −5
E	−1 0 1
G	4 5 6
H	3 4 5
I	6 7 8
K	−3 0 3
L	0 $\frac{1}{2}$ 1 2
M	−2 0 2
N	−12 −11 −10
O	−1 0 1
P	−1 0 1
R	1 2 3
S	−1 $-\frac{1}{2}$ 0 1
T	−5 −4 −3
U	0 1 2
W	1 2 3
Y	−9 −8 −7

Knock knock! Who's there?

$\overline{10}\ \overline{17}\ \overline{28}$. $\overline{10}\ \overline{17}\ \overline{28}$ $\overline{W}\ \overline{1}\ \overline{2}\ \overline{3}$?

$\overline{31}\ \overline{17}\ \overline{12}$ $\overline{43}\ \overline{20}\ \overline{44}\ \overline{8}$ $\overline{14}\ \overline{33}\ \overline{32}$

$\overline{42}\ \overline{24}\ \overline{24}$ $\overline{7}\ \overline{35}\ \overline{9}\ \overline{34}$ $\overline{26}\ \overline{19}\ \overline{27}$.

Knock knock! Who's there?

$\overline{40}\ \overline{25}\ \overline{18}$. $\overline{40}\ \overline{25}\ \overline{18}$ $\overline{W}\ \overline{1}\ \overline{2}\ \overline{3}$?

$\overline{40}\ \overline{29}\ \overline{21}$ $\overline{12}\ \overline{41}\ \overline{4}\ \overline{30}\ \overline{15}$ $\overline{13}\ \overline{16}\ \overline{6}\ \overline{23}$

$\overline{38}\ \overline{20}\ \overline{37}\ \overline{5}\ \overline{11}\ \overline{22}\ \overline{36}\ \overline{39}$?

Making Practice Fun 64 Name_____

Polynomials in Several Variables—Collecting Like Terms, Descending Order

INFORMATION TIME

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

Collect like terms.

1. $a + 6b - 3a + 9b = -2a + 15b$
2. $3a - 4b - 7a + 6b$
3. $x^2 - 3xy + y^2 + 3xy$
4. $x^2 - 2xy + y^2 - 4xy$
5. $3x^2 - 2x^2y + x^2y - x^2$
6. $x^3 - x^2 + x + x^2 - 2x - x^3$
7. $2x^3 + 3x^2 - 3x^3 - 2x^2$
8. $2p^2q - 3pq^2 + p^2q + pq^2$
9. $4t^2 - 9t + 7t^2 + 6t - 11t^2$
10. $9ab - 4a^2 + 2ab - 4a^2$
11. $9x^2 - 4xy + 2x^2 - 2xy - 11x^2$
12. $9x^2 - 4y^2 + 3x - 2y^2 + 2x^2 + 6y^2$
13. $7ae - 2ac + 4ae + 6ac + ae$
14. $9kw - 3ag + 4kw + 2aw + 3ag$
15. $4x^2y - 2xy + 3x^2y - 3xy + 5xy + x^2y$
16. $8x^2y - 3xy^2 + 5x^2y + 2x + 4xy^2 - x - 12x^2y$
17. $9ad - 3d^2 + 4ad + 4a^2$
18. $8d - 5a + 2d - 5a^2 - 10d + a$
19. $9xy - 4x + 5xy + 3x^2 + 4x - xy$
20. $x^3 + 3x^2 + 2x^3 - x^2$
21. $4xy^2 - 2x^2y + 3x^2y - 6xy^2$
22. $e - 7ae + 2a - 4e + 3ae - a$
23. $9km - 3m + 4k + 2m - 3km + k$
24. $13km + 3k - 4m - 8k - 7km + 3m$
25. $9e + 2ae + 6ae - 4e$

Arrange in descending powers of x.

26. $x^2 - 3y^2 + 4xy$
27. $9x^2y^8 - 3xy^2 + 4x^6y^3$
28. $x^6 + x^{10} - xy^{10}$
29. $x^3y^{11} - xy + x^4y^2$

In 1965, an incredible world air speed record was attained. Who was the pilot and what was the speed?

Col. A. Landen 2423 km/h $13xy + 3x^2$	Col. E. Swithe 3100 km/h $13ad - 3d^2 + 4a^2$	Von Schmidt 1873 km/h $-3e - 4ae + a$	Speedy Lopez 2 cm/s $-2a + 15b$	Mathew Noe 2568 km/h $-4a - 5a^2$
Vasher Midt 2130 km/h $11x^2 + 3x$	Col. E. Hall 2798 km/h $-x$	Sgt. K. Fry 1091 km/h $2x^2 - x^2y$	Lt. Donald Awry 4631 km/h $x^2 + y^2$	Lt. Mann 2685 km/h $-3t$
Millie Moore 3111 km/h $6km - m + 5k$	Sam Smithe 2098 km/h $13kw + 2aw$	Frank Wilson 900 km/h $4x^6y^3 + 9x^2y^8 - 3xy^2$	Jetzy Jabor 6000 km/h $3x^3 + 2x^2$	Fast Fred 2000 km/h $-x^3 + x^2$
Col. R. Stephens 3331 km/h $x^2 + 2xy$	Phillip Mann 3001 km/h $x^2 + 4xy - 3y^2$	Col. Mathew 2983 km/h $5e + 8ae$	Alias Rapids 3010 km/h $12ae + 4ac$	Mike Marten 3112 km/h $-6xy$
Kim Jarter 2931 km/h $8x^2y$	Col. T. Winston 2655 km/h $-4a + 2b$	Robert Mandt 2917 km/h $-2xy^2 + x^2y$	Ian Flian 6999 km/h $11ab - 8a^2$	Cap. Rochester 3015 km/h $x^2 - 6xy + y^2$
Jill Hixsor 2774 km/h $3p^2q - 2pq^2$	Dale Farles 2099 km/h $x^{10} + x^6 - xy^{10}$	Phil Todle 1583 km/h $x^4y^2 + x^3y^{11} - xy$	Nolan Noes 2080 km/h $x^2y + xy^2 - x$	Rabe Booth 2091 km/h $6km - m - 5k$

Making Practice Fun 65 Name _____

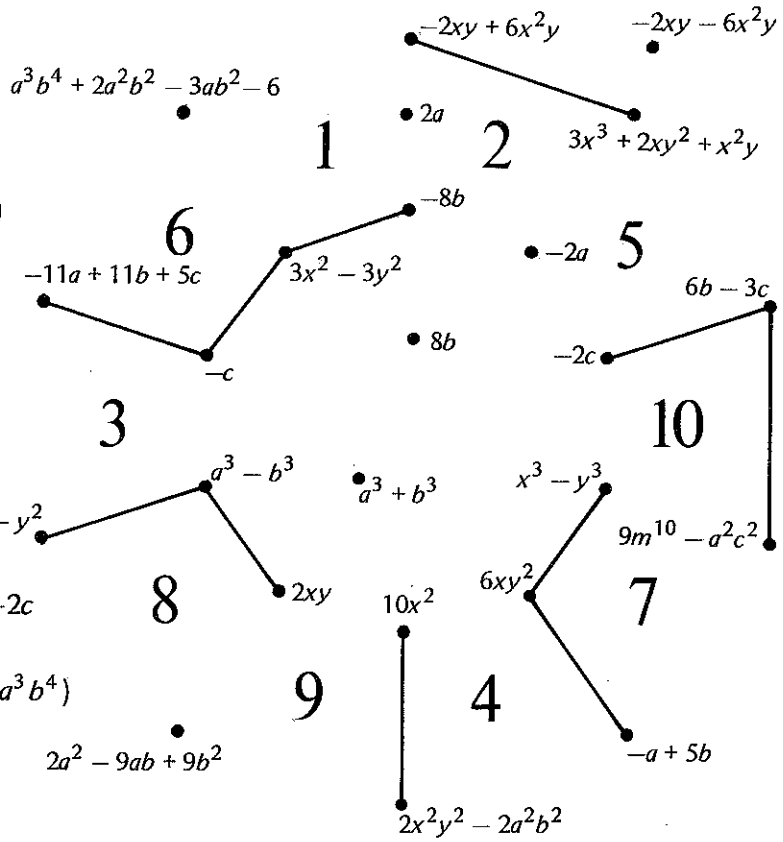
Polynomials in Several Variables—Adding, Subtracting, Multiplying

DIAGRAM PUZZLE

1. Work Exercise A1 and Exercise B1.
2. Draw a straight line segment connecting these two answers.
3. Continue with Exercise A2 and Exercise B2, and so on.
4. Shade in the odd-numbered regions.

Exercises A

1. $(-3a + 2b - c) + (4b + 3a - 2c) = 6b - 3c$
2. $(2x^2y^2 - 4a^2y + a^2b^2) + (4a^2y - 3a^2b^2)$
3. $(7b - 4a + 2c) + (-7a + 4b + 3c)$
4. $(6x^2 - 2x + 3xy) + (2x - 6x^2 - xy)$
5. $(6x^3y^2 - 2xy - x^3y) + (x^3y + 4xy - 6x^3y^2)$
6. $(5x^2 + y^2 - xy) + (x^2 - 2y^2 + 2xy)$
7. $(2y^3 - 3xy) + (x^3 - 3y^3 + 3xy)$
8. $(7x^3 + 2xy^2) + (-4x^3 + x^2y)$
9. $(9a - 3b - 2c) - (9a - 3b - c)$
10. $(4x^2 - 2y^2 + xy) + (2x^2 + y^2)$
11. $(4a - 2b + c) - (6b + 4a + c)$
12. $(4a^2c^2 + 6m^{10}) - (-3m^{10} + 5a^2c^2)$
13. $(4a - 2c + 3b) - (4a + 3b)$
14. $(9a - 3c + 4b) - (11a - 3c + 4b)$
15. $(2x^3 - 3x^2y + 2xy^2) - (-4x^2y - x^3)$
16. $(6xy^2 - 3x^2 + xy) - (xy - 3x^2)$
17. $(xy + x^2y) - (3xy - 5x^2y)$
18. $(xy + ab)(2xy - 2ab)$
19. $(a^2b^2 - 3)(ab^2 + 2)$
20. $(3m^5 - ac)(3m^5 + ac)$



Exercises B

1. $(2a - 4c + 5b) + (2c - 5b - 2a) = -2c$
2. $(6b - 2a + c) + (a - b - c)$
3. $(a^2b^2 - 4ab^2 - 6) + (a^2b^2 + ab^2 + a^3b^4)$
4. $(5x^2 - 3x + 2) + (3x - 2 + 5x^2)$
5. $(3a^2 - 9ab) + (9b^2 - a^2)$
6. $(9a - 3b + 5c) + (-20a + 14b)$
7. $(5a - 3c) + (c - 5a)$
8. $(9ab - 3b) + (-3c + 9b - 9ab)$
9. $(a^3b - a^2b + a^3) + (a^2b - b^3 - a^3b)$
10. $(9b^2 - 3ab + a^2) - (6ab - a^2)$
11. $(3xy + x^2y) - (5xy - 5x^2y)$
12. $3b - (a - 2b)$
13. $6b - (2a + 6b)$
14. $(4b - 2c) - (12b - 2c)$
15. $3c - (2a + 3c)$
16. $10x^2 - y^2 - (-y^2)$
17. $(-3ab^2 + 2a^2b^2) - (6 - a^3b^4)$
18. $(a - 3b)(2a - 3b)$
19. $(x + y)(3x - 3y)$
20. $(x - y)(x^2 + xy + y^2)$

Making Practice Fun 66 Name _____

Polynomials in Several Variables—Multiplying

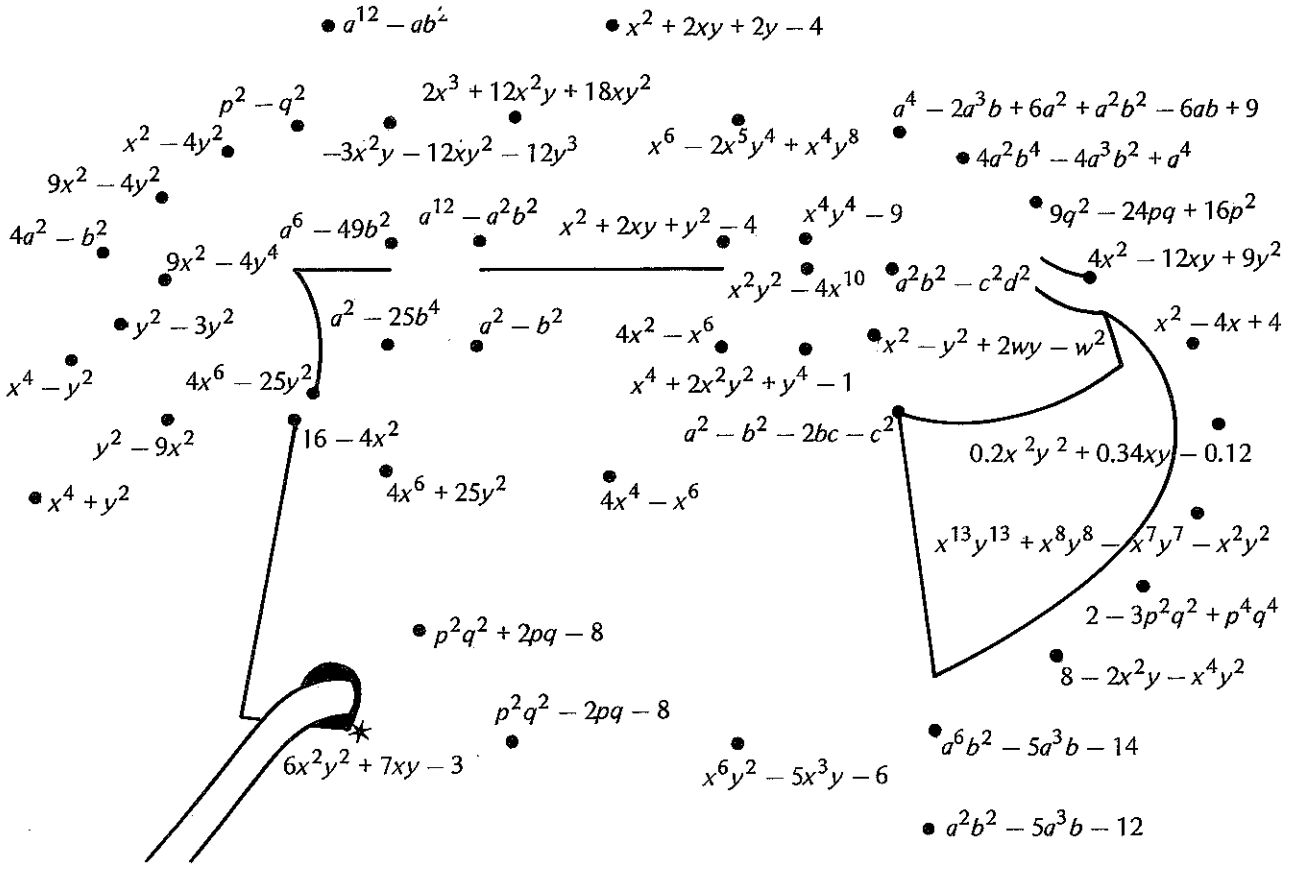
DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Multiply.

1. $(2xy + 3)(3xy - 1)$ $= 6x^2y^2 + 7xy - 3$
2. $(pq - 4)(pq + 2)$
3. $(x^3y - 6)(x^3y + 1)$
4. $(a^3b + 2)(a^3b - 7)$
5. $(2 - x^2y)(4 + x^2y)$
6. $(2 - p^2q^2)(1 - p^2q^2)$
7. $(x^7y^7 - xy)(x^6y^6 + xy)$
8. $(xy - 0.3)(0.2xy + 0.4)$
9. $(x - 2)^2$
10. $(2x - 3y)^2$
11. $(3q - 4p)^2$
12. $(2ab^2 - a^2)^2$
13. $(a^2 - ab + 3)^2$
14. $(x^3 - x^2y^4)^2$
15. $2x(x + 3y)^2$
16. $-3y(x + 2y)^2$
17. $(p + q)(p - q)$
18. $(x + 2y)(x - 2y)$
19. $(3x - 2y)(3x + 2y)$
20. $(2a + b)(2a - b)$
21. $(x^2 - y)(x^2 + y)$
22. $(y - 3x)(y + 3x)$
23. $(4 - 2x)(4 + 2x)$
24. $(2x^3 - 5y)(2x^3 + 5y)$
25. $(a - 5b^2)(a + 5b^2)$
26. $(a^3 - 7b)(a^3 + 7b)$
27. $(a^6 - ab)(a^6 + ab)$
28. $(-a - b)(-a + b)$
29. $(-2x + x^3)(-2x - x^3)$
30. $(x + y - 2)(x + y + 2)$
31. $(x^2y^2 - 3)(x^2y^2 + 3)$
32. $(x^2 + y^2 - 1)(x^2 + y^2 + 1)$
33. $(a + b + c)(a - b - c)$
34. $(x - y + w)(x + y - w)$
35. $(ab - cd)(ab + cd)$
36. $(xy - 2x^5)(xy + 2x^5)$



Making Practice Fun 67

Name_____

Polynomials in Several Variables—Factoring

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

Factor.

1. $kx^2 - ky^2 = k(x - y)(x + y)$
2. $am^2 + at^2$
3. $l^2p - lp^2$
4. $6ac - 12ad$
5. $8\pi r^2 + 4\pi rh$
6. $a^4c^3 + a^3c^3 + a^2c^2$
7. $9x^4y^4 + 12x^3y^3 - 15x^2y^2$
8. $(x + y)(a - 4) + (x + y)(a + 5)$
9. $6k(c + e) - (c + e)$
10. $a^2 - a + ab - b$
11. $ac - bc + ae - be$
12. $3a^2 - 3a + ca - c$
13. $(9x - 2)(x + 5) - 4(x + 5)$
14. $a^3 - a^2 + ca - c$
15. $a^2 - b^2$
16. $m^2 - p^2$
17. $a^2e^2 - d^2$
18. $9u^2 - 4$
19. $16y^2 - 25m^2$
20. $49t^4 - 9m^2$
21. $25u^4 - w^2$
22. $81a^2 - 1$
23. $3a^2 - 75$
24. $5x^2 - 45$
25. $6y^2 - 24$
26. $10a^4 - 90y^2$
27. $m^4 - t^4$
28. $25a^4 - r^4$
29. $a^{10} - a^8$
30. $xw^2 - x - w^2 + 1$
31. $y^4 - x^4$

S $(4y - 5m)(4y + 5m)$	**I** $10(a^2 - 3y)(a^2 + 3y)$	**S** $lp(l - p)$	**O** $(x + 5)(9x - 6)$	**B** $(m - p)(m + p)$
O $3x^2y^2(3x^2y^2 + 4xy - 5)$	**E** $6(y - 2)(y + 2)$	**A** $(7t^2 - 3m)(7t^2 + 3m)$	**S** $6a(c - 2d)$	**Y** $(9a - 1)(9a + 1)$
W $(m^2 + t^2)(m - t)(m + t)$	**H** $5(x - 3)(x + 3)$	**A** $(w - 1)(w + 1)(x - 1)$	**T** $(x + y)(2a + 1)$	**?** $(ae - d)(ae + d)$
C $(5a - r)(5a + r)(5a^2 + r^2)$	**A** $4\pi r(2r + h)$	**R** $(3u - 2)(3u + 2)$	**Y** $k(x - y)(x + y)$	**!** $(a^2 + c)(a - 1)$
U $a(m + t)(m + t)$	**R** $(c + e)(6k - 1)$	**D** $3(a - 5)(a + 5)$	**A** $(5a^2 - r^2)(5a^2 + r^2)$	**Y** $a^2c^2(a^2c + ac + 1)$
T $(m^2 - p^2)(m^2 + p)$	**D** $a(m^2 + t^2)$	**U** $(a - 1)(a + b)$	**D** $(x^2 + y^2)(y - x)(y + x)$	**Y** $(3a + c)(a - 1)$
E $3xy^2(3xy^2 + 4xy - 5)$	**N** $(5u^2 - w)(5u^2 + w)$	**I** $a^8(a - 1)(a + 1)$	**C** $(c + e)(a - b)$	**E** $(a - b)(a + b)$

Making Practice Fun 68 Name _____

Polynomials in Several Variables—Factoring Trinomials

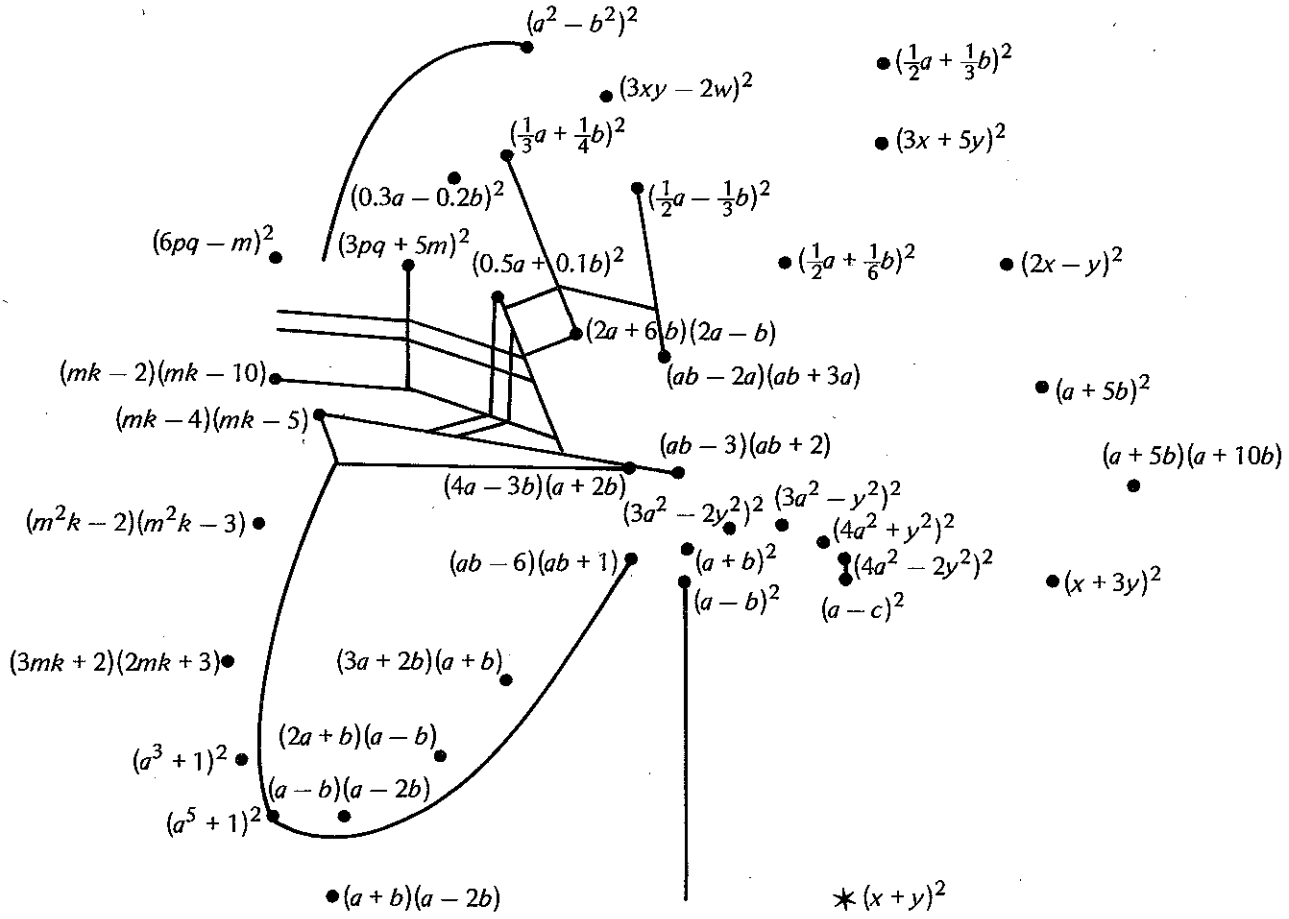
DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Factor.

1. $x^2 + 2xy + y^2 = (x + y)^2$
2. $a^2 - 2ac + c^2$
3. $x^2 + 6xy + 9y^2$
4. $a^2 + 10ab + 25b^2$
5. $4x^2 - 4xy + y^2$
6. $9x^2 + 30xy + 25y^2$
7. $a^4 - 2a^2b^2 + b^4$
8. $9x^2y^2 - 12xyw + 4w^2$
9. $\frac{1}{4}a^2 - \frac{1}{3}ab + \frac{1}{9}b^2$
10. $\frac{1}{9}a^2 + \frac{1}{6}ab + \frac{1}{16}b^2$
11. $0.09a^2 - 0.12ab + 0.04b^2$
12. $0.25a^2 + 0.1ab + 0.01b^2$
13. $9p^2q^2 + 30pqm + 25m^2$
14. $36p^2q^2 - 12pqm + m^2$
15. $m^2k^2 - 12mk + 20$
16. $m^2k^2 - 9mk + 20$
17. $m^4k^2 - 5m^2k + 6$
18. $6m^2k^2 + 13mk + 6$
19. $a^6 + 2a^3 + 1$
20. $a^{10} + 2a^5 + 1$
21. $a^2 - 3ab + 2b^2$
22. $2a^2 - ab - b^2$
23. $3a^2 + 5ab + 2b^2$
24. $4a^2 + 5ab - 6b^2$
25. $4a^2 + 10ab - 6b^2$
26. $a^2b^2 + a^2b - 6a^2$
27. $a^2b^2 - ab - 6$
28. $a^2b^2 - 5ab - 6$
29. $a^2 - 2ab + b^2$
30. $a^2 + 2ab + b^2$
31. $9a^4 - 12a^2y^2 + 4y^4$
32. $9a^4 - 6a^2y^2 + y^4$
33. $16a^4 + 8a^2y^2 + y^4$
34. $16a^4 - 16a^2y^2 + 4y^4$



Making Practice Fun 69 Name _____

Polynomials in Several Variables—Solving Equations

FACTS ABOUT FIRST LADIES

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Solve for x, y, or w.

1. $3a + 2x = 10$ $x = 5 - \frac{3}{2}a$ T
2. $y - c = 2p$
3. $2a - 3x = 1$
4. $4w - 8c = 12p$
5. $3y - 9k = 15t$
6. $(x - c)(x + d) = x^2 + 4$
7. $(x - c)(x + d) = x^2 - 4$
8. $(y - 2)(y + 3) = y^2 + c$
9. $c(x + a) = x - (3 - c)$
10. $5a + 2x = 7x$
11. $3a - 4x = -a - 4$
12. $4c - 3x = 9e - 5c$
13. $3(x - c) = 6p$
14. $m(y - 3c) = -2mc + 6m$
15. $x(a + 4) - 3 = e(x + 2)$
16. $3(w - 1) + a^2 = (a + 1)^2 + a - 1$
17. $5c(x - 6) = 4cx + c(a - 29)$
18. $6c(x + 6) = 2cx + 4c(a + 8)$
19. $c(x + a) = c - 3 + x$
20. $(w - 10)^2 = w^2 - 20c - 20$
21. $9y - 6a = -3$
22. $xc^2 - cdx - 4c + c^2d = 0$
23. $(w - p)^2 = w^2 - 3p^2 - 2pc$
24. $2(w - 2k) = 10t + 2k$
25. $y(3y - 2) = 3y^2 - 2c - 12$
26. $4x - 3k = 3(3 - k) - 1 + a$
27. $y(a + 4) - 3 = e(2 + y)$
28. $(x + 1)(x - 1) = a^2 + 2a$
29. $(x - c)^2 = 4p^2$
30. $2a + 3x = 5a + 6$
31. $12w - 8a = -4$
32. $a^2 + 5(x + 1) + 6 = (a + 2)(a + 3)$
33. $4w^2 = (a - b)^2$
34. $5(x - c) = 5a + 5c$

Code Letter	Answer
A	$a + 1$
B	$a - 1$
C	$-3e + 3c$
D	$\frac{a - b}{2}$
E	$2p + c$
F	$a + 2$
G	$\frac{4 + cd}{d - c}$
H	$2c + 3p$
I	$-\frac{1}{3} + \frac{2}{3}a$
L	$\frac{2e + 3}{a - e + 4}$
M	$c + 6$
N	$a + 2c$
O	$\frac{c - 3 - ac}{c - 1}$
R	$5t + 3k$
S	$\frac{4 - cd}{c - d}$
T	$5 - \frac{3}{2}a$
U	$\frac{1}{4}a + 2$
Y	a

What are the first names of these first ladies?

$\frac{}{8}\ \frac{}{11}\ \frac{}{5}\ \frac{T}{1}\ \frac{}{4}\ \frac{}{11}$ Washington

$\frac{}{31}\ \frac{}{33}\ \frac{}{28}$ McKinley

$\frac{}{30}\ \frac{}{27}\ \frac{}{19}\ \frac{}{24}\ \frac{}{13}\ \frac{}{34}\ \frac{}{12}\ \frac{}{29}$ Harding

$\frac{}{27}\ \frac{}{9}\ \frac{}{26}$ Hoover

$\frac{}{18}\ \frac{}{23}\ \frac{}{7}\ \frac{}{22}$ Truman

$\frac{}{25}\ \frac{}{16}\ \frac{}{24}\ \frac{}{10}$ Lincoln

$\frac{}{20}\ \frac{}{17}\ \frac{}{14}\ \frac{}{21}\ \frac{}{2}$ Eisenhower

$\frac{}{28}\ \frac{}{32}\ \frac{}{31}\ \frac{}{6}\ \frac{}{28}\ \frac{}{3}\ \frac{}{15}$ Fillmore

Making Practice Fun 70 Name _____

Polynomials in Several Variables—Solving Formulas

INFORMATION TIME

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

Solve for the indicated letter.

1. $S = 2\pi rh; h$ $\quad \frac{S}{2\pi r}$
2. $A = \frac{bl}{2}; l$
3. $E = \frac{1}{2}mv^2; m$
4. $G = 90(n-4); n$
5. $S = h(2l + 2w); w$
6. $K = mr - mv; m$
7. $S = \pi r(r-k); k$
8. $A = \frac{1}{2}h(b_1 + b_2); b_2$
9. $F = K\frac{m_1 \cdot m_2}{R^2}; m_1$
10. $I = c + (e-1)m; e$
11. $I = c - (e+1)m; e$
12. $R = \frac{MB - T}{K}; M$
13. $R = \frac{c^2hm}{e}; e$
14. $y = R + \frac{P^2KL}{a}; K$
15. $L = vg - vt; v$
16. $L = vg - vt; g$
17. $V = I^2R; R$
18. $P = 2(l + w); w$
19. $D = \frac{Ke - P}{R}; K$
20. $R = \frac{Ke + P}{D}; P$
21. $R = \frac{Ke + P}{D}; K$

What national championship did Carroll Resweber win four years in a row?

KITE $\frac{2A}{b}$	FLYING $\frac{(y-R)a}{P^2L}$	ALTITUDE $\frac{V}{l^2}$	CONTEST $\frac{G}{90}+4$	RACING $\frac{l-c}{m}+1$	SPEED $\frac{2E}{v^2}$
BAREFOOT $RD - Ke$	HORSE $\frac{S}{2h} - l$	KANGAROO $\frac{K}{r-v}$	RACING $\frac{(y-R)L}{aP^2}$	FLYING $\frac{DR-P}{e}$	HUNTING $\frac{RK+T}{B}$
BI $\frac{2A}{h} - b_1$	UNI $\frac{c-l}{m} - 1$	CYCLE $\frac{c-l}{m} + 1$	RACING $\frac{P}{2} - l$	IN $\frac{L}{g-t}$	DOOR $\frac{S}{2\pi r}$
THE $\frac{RD+P}{e}$	MOTOR $\frac{l-c}{m} - 1$	LESS $\frac{c^2hm}{R}$	BIKE $\frac{L+vt}{v}$	RACING $\frac{FR^2}{Km_2}$	RACING $r - \frac{S}{\pi r}$

Making Practice Fun 71 Name_____

Fractional Expressions—Simplifying, Multiplying

DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

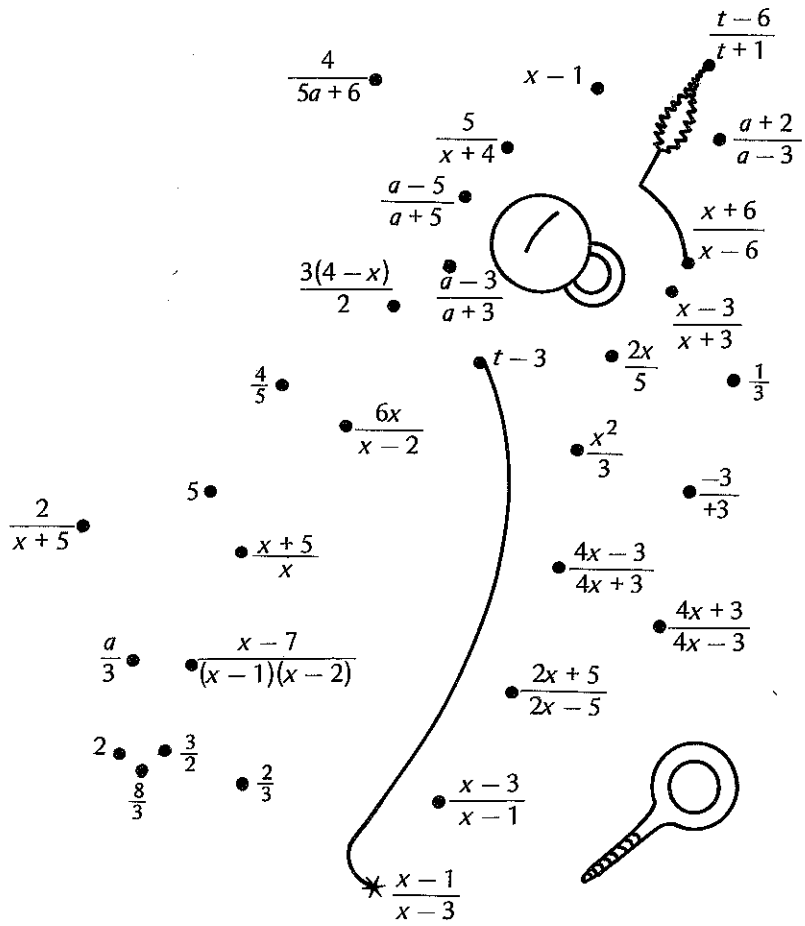
Exercises

Simplify.

1. $\frac{(x+4)(x-1)}{(x+4)(x-3)} = \frac{x-1}{x-3}$
2. $\frac{(x-3)(x+2)}{(x+2)(x-1)}$
3. $\frac{x(2x+5)(x-5)}{x(x-5)(2x-5)}$
4. $\frac{x(2x+7)(4x-3)}{x(4x+3)(2x+7)}$
5. $\frac{3x^3}{9x}$
6. $\frac{10x^2}{25x}$
7. $\frac{4x-12}{4x+12}$
8. $\frac{7x+42}{7x-42}$
9. $\frac{a^2-4}{a^2-5a+6}$
10. $\frac{t^2-36}{t^2+7t+6}$
11. $\frac{x^2-1}{x+1}$
12. $\frac{5x+10}{x^2+6x+8}$
13. $\frac{a^2-25}{(a+5)^2}$
14. $\frac{a^2-11a+24}{a^2-5a-24}$
15. $\frac{48x-3x^3}{8x+2x^2}$

Multiply and simplify.

16. $\frac{4}{x} \cdot \frac{x}{5}$
17. $\frac{25}{x} \cdot \frac{x}{5}$
18. $\frac{9}{a} \cdot \frac{a^2}{27}$
19. $\frac{x+5}{3} \cdot \frac{6}{x+5}$
20. $\frac{4t+4}{11} \cdot \frac{22}{3t+3}$
21. $\frac{5t-5}{6} \cdot \frac{18}{10t-10}$
22. $\frac{x^2-11x+28}{(x-1)^2} \cdot \frac{x-1}{x^2-6x+8}$
23. $\frac{x^2-25}{x^2} \cdot \frac{x^2+2x}{x^2-3x-10}$
24. $\frac{9x^2}{x^2-9x+14} \cdot \frac{2x-14}{3x}$
25. $\frac{3t^2-9t}{t+8} \cdot \frac{t^2-64}{3t^2-24t}$



Making Practice Fun 72 Name _____

Fractional Expressions—Dividing and Simplifying

MESSAGE IN CODE

1. Work each exercise and simplify the answer.
2. Find the code letter for that answer.
3. Write the code letter in the blank by the exercise number. You may use the same code letter several times. To read the message, skip some letters.

Exercises

Divide and simplify.

S 1. $\frac{3}{5} \div \frac{2}{7} = 2\frac{1}{10}$ S

_____ 2. $\frac{4}{7} \div \frac{1}{5}$

_____ 3. $\frac{4}{5} \div \frac{2}{3}$

_____ 4. $\frac{7}{8} \div \frac{3}{4}$

_____ 5. $\frac{3}{x} \div \frac{4}{x}$

_____ 6. $\frac{7}{x} \div \frac{21}{x}$

_____ 7. $\frac{2}{x} \div \frac{x}{3}$

_____ 8. $\frac{7x}{18} \div \frac{x}{3}$

_____ 9. $\frac{10}{21x} \div \frac{1}{6x}$

_____ 10. $\frac{x+3}{x-1} \div \frac{2x+6}{x-1}$

_____ 11. $\frac{7x+35}{x+4} \div \frac{12x+60}{2x+8}$

_____ 12. $\frac{x^2-4}{x+3} \div \frac{x-2}{x^2+4x+4}$

_____ 13. $\frac{x^2-9}{x^2-25} \div \frac{2x-6}{3x-15}$

_____ 14. $\frac{x-9}{3x} \div \frac{x^2-81}{9x^2}$

_____ 15. $\frac{x-4}{5x} \div \frac{x^2-16}{10x^2}$

_____ 16. $\frac{x-2}{x+1} \div \frac{x+2}{x^2-1}$

_____ 17. $\frac{2x^2-6x}{x^2+5x+4} \div \frac{x-3}{x+1}$

_____ 18. $\frac{x^2+7x}{x^2+2x-15} \div \frac{x^2+2x}{x^2-x-6}$

_____ 19. $\frac{3x^2+12x+9}{2x^2+8x-10} \div \frac{x+1}{x-1}$

_____ 20. $\frac{3x^2+9x}{2x^2+14x+20} \div \frac{x}{x+2}$

_____ 21. $\frac{x^2-49}{x^2-25} \div \frac{x-7}{x-5}$

Code Letter	Simplified Answer	Code Letter	Simplified Answer	Code Letter	Simplified Answer
A	$2\frac{6}{7}$	H	$\frac{(x+2)^3}{x+3}$	P	$\frac{6}{x^2}$
B	$\frac{3(x+2)}{2(x+5)}$	I	$\frac{3}{4}$	R	$\frac{x+7}{x+5}$
C	$\frac{(x+2)^2}{x+3}$	K	$1\frac{1}{5}$	S	$2\frac{1}{10}$
D	$6\frac{2}{7}$	L	$1\frac{1}{6}$	T	$\frac{2x}{x+4}$
E	$\frac{3(x+3)}{2(x+5)}$	M	$\frac{1}{3}$	W	$\frac{3x}{x+9}$
F	$\frac{4}{3}$	N	$\frac{2}{1}$	Y	$\frac{1}{2}$
G	3	O	$\frac{(x-2)(x-1)}{x+2}$	Z	$\frac{x+9}{3x}$

Making Practice Fun 73 Name _____

Fractional Expressions—Adding, Same Denominator

INFORMATION TIME

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

Add.

1. $\frac{3}{16} + \frac{5}{16} = \frac{1}{2}$
2. $\frac{7}{11} + \frac{4}{11}$
3. $\frac{2}{7+x} + \frac{5}{7+x}$
4. $\frac{9}{3-x} + \frac{4}{3-x}$
5. $\frac{2x+3}{3x+5} + \frac{x-3}{5+3x}$
6. $\frac{7x-2}{2x+11} + \frac{3x+2}{11+2x}$
7. $\frac{x^2+9x}{x^2-2x} + \frac{x^2-4x}{x^2-2x}$
8. $\frac{9}{11} + \frac{-2}{11}$
9. $\frac{4x^2+5x-3}{x^3} + \frac{3x^2-2x+3}{x^3}$
10. $\frac{x^2-x+1}{x} + \frac{x-x^2+1}{x}$
11. $\frac{3x^2-2x+6}{x^2} + \frac{7x^2+2x-6}{x^2}$
12. $\frac{7}{9} + \frac{4}{-9}$
13. $\frac{4}{t} + \frac{-7}{t}$
14. $\frac{9}{-a} + \frac{4}{a}$
15. $\frac{3x+2}{x-5} + \frac{2x}{5-x}$
16. $\frac{4x-6}{x-5} + \frac{4x+6}{5-x}$
17. $\frac{a-9}{a^2-49} + \frac{a+9}{49-a^2}$
18. $\frac{a+4}{a^2-1} + \frac{a+5}{1-a^2}$
19. $\frac{c+3}{3c-2} + \frac{2c+1}{2-3c} + \frac{3c-1}{-2+3c}$
20. $\frac{4c-6}{3c-2} + \frac{2c-8}{2-3c} + \frac{2-3c}{-2+3c}$
21. $\frac{2(x-1)}{3x-4} + \frac{3(x-1)}{4-3x}$
22. $\frac{4(x+2)}{5x-2} + \frac{2(x-3)}{2-5x}$
23. $\frac{3(x-6)}{3x-1} + \frac{2(6-x)}{1-3x} + \frac{3(2x+1)}{-1+3x}$

If you could carry out the expression $\frac{2 \cdot 2 \cdot 4 \cdot 4 \cdot 6 \cdot 6 \cdot 8 \cdot 8 \cdot \ldots}{1 \cdot 1 \cdot 3 \cdot 3 \cdot 5 \cdot 5 \cdot 7 \cdot 7 \cdot \ldots}$ ***indefinitely, what would you get?***

M $\frac{7x+3}{x^2}$	**U** $-\frac{3}{t}$	**C** $\frac{1}{2}$	**H** $\frac{2}{x}$	**P** 1
H $\frac{2c+1}{3c-2}$	**I** $\frac{2x+5}{x-2}$	**L** $\frac{-12}{x-5}$	**O** $\frac{-1}{a^2-1}$	**P** $\frac{11x-30}{3x-1}$
T $\frac{1}{3}$	**E** $\frac{13}{3-x}$	**N** $\frac{7}{11}$	**O** $\frac{7}{7+x}$	**A** $\frac{-5}{a}$
P $\frac{-18}{a^2-49}$	**I** $\frac{2x+14}{5x-2}$	**N** $\frac{-x+1}{3x-4}$	**E** $\frac{11x-27}{3x-1}$	**I** $\frac{2x+14}{2-5x}$
S $\frac{-c+4}{3c-2}$	**I** $\frac{10x}{2x+11}$	**X** $\frac{x+2}{x-5}$	**W** $\frac{3x}{3x+5}$	**D** 10

Making Practice Fun 74 Name _____

Fractional Expressions—Subtracting, Same Denominators

FACTS ABOUT CONSTELLATIONS

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Subtract.

1. $\frac{7}{9} - \frac{4}{9} = \frac{1}{3}$ U
2. $\frac{7}{8} - \frac{3}{8}$
3. $\frac{8}{y} - \frac{11}{y}$
4. $\frac{7}{x} - \frac{1}{x}$
5. $\frac{x}{x-2} - \frac{2}{x-2}$
6. $\frac{x}{x+3} - \frac{3}{x+3}$
7. $\frac{4}{x+7} - \frac{4}{x+7}$
8. $\frac{4x}{9x} - \frac{x}{9x}$
9. $\frac{2x}{x+3} - \frac{x-3}{x+3}$
10. $\frac{3x-2}{x+5} - \frac{4x+3}{x+5}$
11. $\frac{3x}{2x+10} - \frac{2x-5}{2x+10}$
12. $\frac{5x^2-4x+3}{7x+1} - \frac{3x^2+2x+1}{7x+1}$
13. $\frac{-4x-3}{7x+1} - \frac{3x-2}{7x+1}$
14. $\frac{5}{x+2} - \frac{7+x}{x+2}$
15. $\frac{12}{5} - \frac{3}{-5}$
16. $\frac{-2}{7} - \frac{2}{-7}$
17. $\frac{-12}{y} - \frac{9}{-y}$
18. $\frac{x}{5-x} - \frac{4+4x}{x-5}$
19. $\frac{3x^2+2}{7x+1} - \frac{x^2+6x}{7x+1}$
20. $\frac{4-x}{x-5} - \frac{2x-4}{5-x}$
21. $\frac{2x}{3} - \frac{-x-9}{3}$
22. $\frac{6x-2}{x-1} - \frac{2x-6}{1-x}$
23. $\frac{-x}{1} - \frac{2x+3}{-1}$
24. $\frac{-7x-1}{x^2-25} - \frac{9x}{25-x^2}$

Code Letter	Answer
A	1
B	$\frac{3}{y}$
C	$\frac{1}{2}$
D	$\frac{2x-1}{x^2-25}$
E	$-\frac{3}{y}$
F	$\frac{x+3}{x-3}$
G	$x+3$
I	0
L	$\frac{x}{x-5}$
M	$\frac{5x+4}{5-x}$
N	$\frac{2x^2-6x+2}{7x+1}$
O	8
P	$\frac{6}{x}$
R	3
S	-1
T	$\frac{2x^2-6x+1}{7x+1}$
U	$\frac{1}{3}$
Y	$\frac{x-3}{x+3}$

Which constellation is called . . .

"The Dragon"? $\frac{}{24}\ \frac{}{15}\ \frac{}{5}\ \frac{}{2}\ \frac{}{22}$

"The Twins"? $\frac{}{21}\ \frac{}{17}\ \frac{}{18}\ \frac{}{7}\ \frac{}{19}\ \frac{}{16}$

"The Swan"? $\frac{}{11}\ \frac{}{6}\ \frac{}{23}\ \frac{}{12}\ \frac{}{8}\ \frac{}{13}$

"The Winged Horse"? $\frac{}{4}\ \frac{}{17}\ \frac{}{23}\ \frac{}{9}\ \frac{}{13}\ \frac{U}{1}\ \frac{}{14}$

"The Hare"? $\frac{}{20}\ \frac{}{3}\ \frac{}{4}\ \frac{}{8}\ \frac{}{10}$

Making Practice Fun 75 Name _____

Fractional Expressions—Finding the LCM

DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

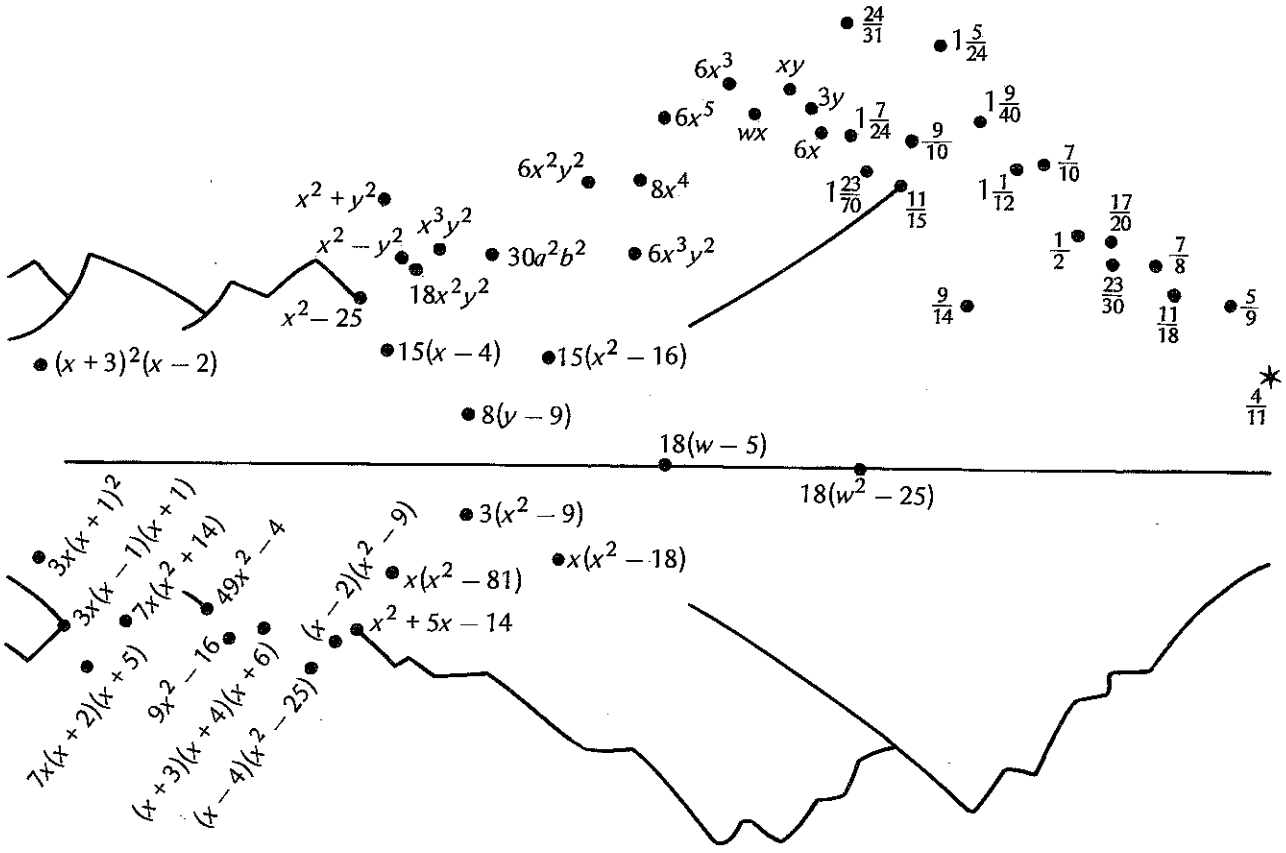
Exercises

Add.

1. $\frac{1}{11} + \frac{3}{11} = \frac{4}{11}$
2. $\frac{4}{9} + \frac{1}{6}$
3. $\frac{3}{8} + \frac{1}{2}$
4. $\frac{7}{15} + \frac{3}{10}$
5. $\frac{3}{5} + \frac{1}{4}$
6. $\frac{5}{14} + \frac{1}{7}$
7. $\frac{1}{3} + \frac{1}{5} + \frac{1}{6}$
8. $\frac{1}{2} + \frac{1}{3} + \frac{1}{4}$
9. $\frac{7}{8} + \frac{1}{5} + \frac{3}{20}$
10. $\frac{4}{15} + \frac{3}{10} + \frac{1}{6}$
11. $\frac{8}{35} + \frac{4}{5} + \frac{3}{10}$
12. $\frac{1}{6} + \frac{3}{8} + \frac{3}{4}$

Find the LCM.

13. $x, 6x$
14. $y, 3y$
15. x, y
16. w, x
17. $3x^2, 6x^3$
18. $4x^3, 8x^4$
19. $3x^2y, 6xy^2$
20. $10a^2b, 15ab^2$
21. x^2y, xy^2, x^3y
22. $3x^2, 9xy^2, 18x$
23. $x + y, x - y$
24. $x + 5, x - 5$
25. $3(x - 4), 5(x - 4)$
26. $2(y - 9), 8(y - 9)$
27. $6(5 - w), 9(w - 5)$
28. $3, x + 3, x - 3$
29. $x, x + 9, x - 9$
30. $x - 2, x^2 + 5x - 14$
31. $x^2 - 9, x^2 - 5x + 6$
32. $x^2 - 25, x^2 - 9x + 20$
33. $x^2 + 9x + 18, x^2 + 7x + 12$
34. $4 - 3x, 4 + 3x, 9x^2 - 16$
35. $2 - 7x, 49x^2 - 4, 2 + 7x$
36. $7x^2 + 14x, 7x^3 + 49x^2 + 70x$
37. $3x^2 - 3x, 3x^3 - 3x$



Making Practice Fun 76 Name _____

Fractional Expressions—Adding, Different Denominators

INFORMATION TIME

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

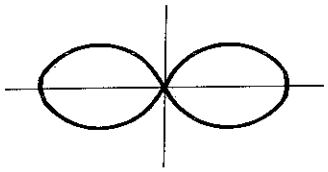
Exercises

Add and simplify.

1. $\frac{3}{x^2}+\frac{5}{x}=\frac{3+5x}{x^2}$ D
2. $\frac{4}{x}+\frac{6}{x^2}$
3. $\frac{4}{5x}+\frac{3}{10x}$
4. $\frac{5}{7t}+\frac{3}{14t}$
5. $\frac{3}{10t}+\frac{2}{15t}$
6. $\frac{1}{2t}+\frac{2}{7t}$
7. $\frac{3}{8t}+\frac{1}{2t}$
8. $\frac{4}{x+1}+\frac{2}{x}$
9. $\frac{2}{x+3}+\frac{3}{(x+3)^2}$
10. $\frac{-5x}{x^2-16}+\frac{x+1}{x-4}$
11. $\frac{x+1}{x-1}+\frac{x-1}{x+1}$
12. $\frac{x}{x^2-1}+\frac{3x}{x^2+x}$
13. $\frac{2x}{3x-2}+\frac{3x}{2x-3}$
14. $\frac{3}{x-5}+\frac{3x^2+21x+30}{x^2-25}$
15. $\frac{-x^2+7x-8}{x^2-16}+\frac{x-2}{x+4}$
16. $\frac{2}{x^2-5x+4}+\frac{3}{x^2-16}$

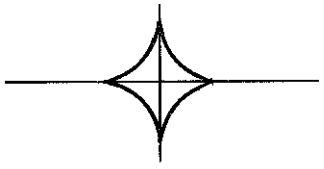
Code Letter	Simplified Answer
A	$\frac{6x+2}{x(x+1)}$
B	$\frac{11}{14t}$
C	$\frac{x(13x-12)}{(3x-2)(2x-3)}$
D	$\frac{3+5x}{x^2}$
E	$\frac{2x+9}{(x+3)^2}$
F	$\frac{5(x+1)}{(x-1)(x^2-16)}$
G	$\frac{13x^2-10x}{(3x-2)(2x-3)}$
H	$\frac{2x-9}{(x+3)^2}$
I	$\frac{13}{14t}$
L	$\frac{x}{x^2-16}$
M	$\frac{2(x^2+1)}{x^2-1}$
N	$\frac{11}{10x}$
O	$\frac{7}{8t}$
P	$\frac{x^2+4}{x^2-16}$
R	$\frac{4x-3}{x^2-1}$
S	$\frac{13}{30t}$
T	$\frac{3(x+3)}{x-5}$
U	$\frac{4x+6}{x^2}$
Y	$\frac{x-3}{x-5}$

What are the names of these curves?

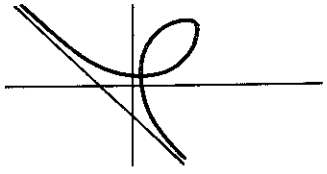


$\frac{}{15}\ \frac{}{9}\ \frac{}{11}\ \frac{}{3}\ \frac{}{4}\ \frac{}{5}\ \frac{}{13}\ \frac{}{8}\ \frac{}{14}\ \frac{}{9}$

$\frac{}{7}\ \frac{}{16}\ \frac{}{6}\ \frac{}{9}\ \frac{}{12}\ \frac{}{3}\ \frac{}{7}\ \frac{}{2}\ \frac{}{15}\ \frac{}{15}\ \frac{}{4}$

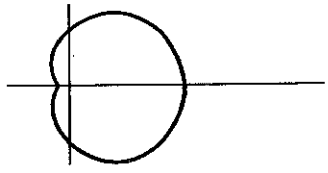


$\frac{}{8}\ \frac{}{5}\ \frac{}{14}\ \frac{}{12}\ \frac{}{7}\ \frac{}{4}\ \frac{D}{1}$



$\frac{}{16}\ \frac{}{7}\ \frac{}{15}\ \frac{}{4}\ \frac{}{2}\ \frac{}{11}\ \frac{}{7}\ \frac{}{16}$

$\frac{D}{1}\ \frac{}{9}\ \frac{}{5}\ \frac{}{13}\ \frac{}{8}\ \frac{}{12}\ \frac{}{14}\ \frac{}{9}\ \frac{}{5}$



$\frac{}{15}\ \frac{}{4}\ \frac{}{11}\ \frac{}{8}\ \frac{}{13}\ \frac{}{7}\ \frac{}{3}$

$\frac{}{7}\ \frac{}{16}\ \frac{}{10}\ \frac{}{8}\ \frac{}{5}\ \frac{}{13}\ \frac{}{8}\ \frac{}{15}$

Making Practice Fun 77 Name _____

Fractional Expressions—Subtracting, Different Denominators

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

Subtract.

1. $\frac{2}{x} - \frac{7}{x^2} = \frac{2x-7}{x^2}$
2. $\frac{7}{x} - \frac{3}{x^2}$
3. $\frac{4}{7y} - \frac{3}{14y}$
4. $\frac{7}{9t} - \frac{11}{6t}$
5. $\frac{x-3}{4} - \frac{x+1}{2}$
6. $\frac{4x-1}{9} - \frac{x+2}{3}$
7. $\frac{2x-1}{6x} - \frac{4x+1}{9x}$
8. $\frac{7x+5}{2x} - \frac{x+1}{x}$
9. $\frac{3x-9}{2x} - \frac{4x-7}{3x}$
10. $\frac{7x+2y}{3xy^2} - \frac{2x-5y}{x^2y}$
11. $\frac{9}{x+6} - \frac{2}{x-6}$
12. $\frac{4}{x+2} - \frac{4}{x-2}$
13. $\frac{2x}{x-1} - \frac{3x}{x+1}$
14. $\frac{6}{x+3} - \frac{5}{x-3}$
15. $\frac{7}{xy} - \frac{8}{x}$
16. $\frac{3}{x^2y} - \frac{2}{xy^2}$
17. $\frac{4x}{x^2-25} - \frac{3}{x+5}$
18. $\frac{4}{3a^2-6a} - \frac{2}{3a-6}$
19. $\frac{7x+4}{x^2+5x+6} - \frac{2}{x+3}$
20. $\frac{3x}{x^2-9} - \frac{2}{x+3}$
21. $\frac{3y}{x^2-y^2} - \frac{y}{x-y}$
22. $\frac{2x+14}{x^2+5x-14} - \frac{2}{x-2}$
23. $\frac{x}{x^2-1} - \frac{1}{x-1}$
24. $\frac{1}{x+1} - \frac{1}{x-1}$
25. $\frac{x}{x-1} - \frac{x}{x+1}$

S $\frac{x+6}{x^2-9}$	**C** $\frac{3y+xy-y^2}{x^2-y^2}$	**H** $\frac{x-7}{9}$	**O** $\frac{x-33}{x^2-9}$	**O** $\frac{x+15}{x^2-25}$	**L** $\frac{-19}{18t}$
S $\frac{7x-3}{x^2}$	**C** $\frac{-16}{x^2-4}$	**H** $\frac{1}{x^2-1}$	**O** $\frac{-2}{x^2-1}$	**O** $\frac{7x^2-4xy+15y^2}{3x^2y^2}$	**L** 0
O $\frac{4-2a}{3a(a-2)}$	**R** $\frac{2x}{x^2-1}$	**M** $\frac{-1}{x^2-1}$	**A** $\frac{5x-4}{x^2+5x+6}$	**T** $\frac{2x-7}{x^2}$	**H** $\frac{-x^2+5x}{x^2-1}$
O $\frac{x-13}{6x}$	**R** $\frac{-x-5}{4}$	**F** $\frac{3y-2x}{x^2y^2}$	**A** $\frac{5x}{x^2+5x+6}$	**M** $\frac{2}{x^2-1}$	**E** $\frac{-2x-5}{18x}$
O $\frac{7-8y}{xy}$	**R** $\frac{3y-xy-y^2}{x^2-y^2}$	**S** $\frac{5}{14y}$	**T** $\frac{7x-66}{x^2-36}$	**O** $\frac{5x+3}{2x}$	**P** $\frac{16}{x^2-4}$

Making Practice Fun 78

Name _____

Dividing Polynomials

FACTS ABOUT AUTHORS

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Divide.

1. $(4x^3 - 5x^2 - 4x - 4) \div (x - 2) = 4x^2 + 3x + 2$ **V**
2. $(3x^3 + 13x^2 - 9x + 5) \div (x + 5)$
3. $(x^3 + 2x^2 + 2x + 1) \div (x + 1)$
4. $(3x^3 - 8x^2 - 20x - 16) \div (x - 4)$
5. $(2x^4 + 7x^3 + 2x^2 + x + 12) \div (x + 3)$
6. $(x^3 - 5x^2 - 13x - 7) \div (x - 7)$
7. $\dfrac{x^2 - 16}{x + 4}$
8. $\dfrac{x^3 + 1}{x + 1}$
9. $\dfrac{x^2 - 49}{x - 7}$
10. $\dfrac{15x^3 - 22x^2 + 11x - 2}{3x - 2}$
11. $\dfrac{15x^3 - 2x^2 - 11x - 2}{3x + 2}$
12. $\dfrac{x^4 - 1}{x - 1}$
13. $(2x^3 - x^2 + x + 1) \div (2x + 1)$
14. $\dfrac{x^4 - 16}{x + 2}$
15. $\dfrac{x^2 + 13x + 42}{x + 6}$
16. $(x^4 - x^2 + x - 1) \div (x - 1)$
17. $(-x^4 + x^2 - x - 1) \div (x + 1)$
18. $(x^4 - x^3 + x - 1) \div (x^3 + 1)$
19. $(x^4 + x^3 - x^2 - 1) \div (x - 1)$
20. $(8x^3 - 16x^2 + 8x - 3) \div (2x - 3)$

Who wrote . . .

The Wizard of Oz? ___ ___ ___ ___
16 5 19 14

The Legend of Sleepy Hollow? ___ ___ V ___ ___ ___
10 9 1 10 7 3

The Scarlet Pimpernel? ___ ___ ___ ___ ___
18 15 17 20 11

Frankenstein? ___ ___ ___ ___ ___ ___ ___
12 6 2 13 8 2 11

Ivanhoe? ___ ___ ___ ___ ___
12 17 18 4 4

The Catcher in the Rye? ___ ___ ___ ___ ___ ___ ___ ___
12 5 13 10 7 3 2 9

Exodus? ___ ___ ___ ___
19 9 10 12

Moby Dick? ___ ___ ___ V ___ ___ ___ ___
14 2 13 1 10 13 13 2

Code Letter	Answer
A	$2x^3 + x^2 - x + 4$
B	$x^3 + x^2 + 1$
C	$-x^3 + x^2 - 1$
D	$x^2 + x - 1$
E	$3x^2 - 2x + 1$
G	$x^2 + x + 1$
H	$x^2 + 2x + 1$
I	$5x^2 - 4x + 1$
L	$x^2 - x + 1$
M	$(x - 2)(x^2 + 4)$
N	$x - 4$
O	$x - 1$
R	$x + 7$
S	$(x + 1)(x^2 + 1)$
T	$(x + 2)(3x - 2)$
U	$x^3 + 2x^2 + x + 1$
V	$4x^2 + 3x + 2$
Y	$5x^2 - 4x - 1$
Z	$4x^2 - 2x + 1$

Making Practice Fun 79

Name_____

Solving Fractional Equations

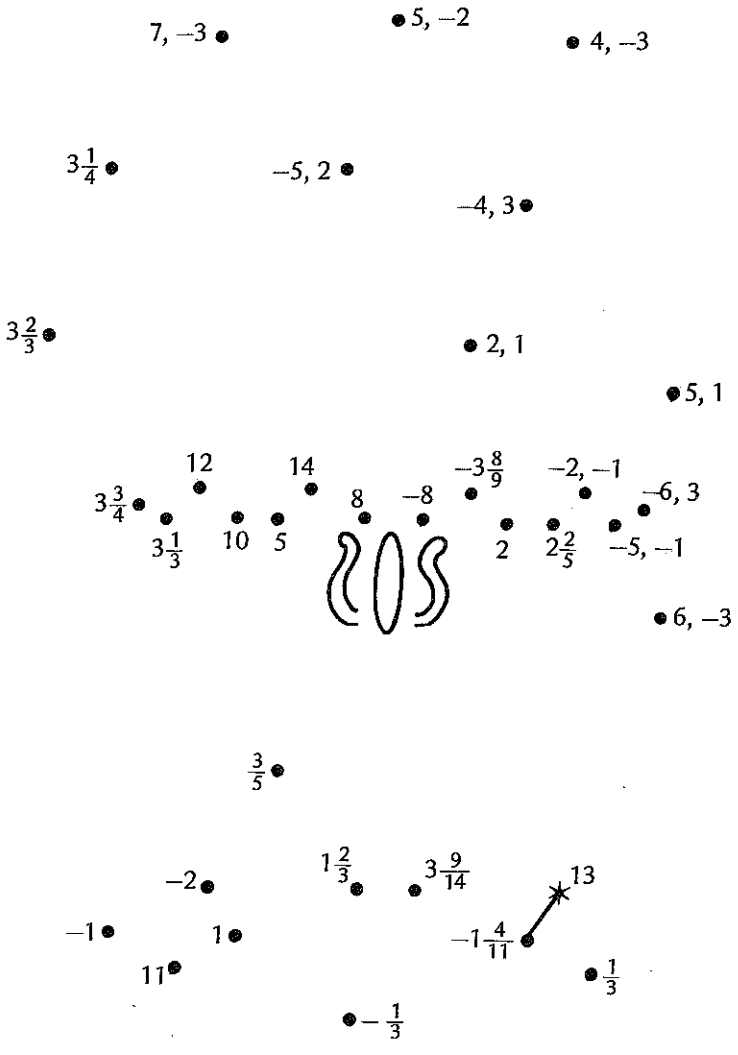
DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Solve.

1. $\frac{3}{4} + \frac{1}{3} = \frac{x}{12}$ $x = 13$
2. $\frac{5}{7} + \frac{1}{2} = \frac{x}{3}$
3. $\frac{3}{4} - \frac{7}{8} = \frac{1}{x}$
4. $\frac{1}{7} - \frac{2}{5} = \frac{1}{x}$
5. $\frac{1}{3} + \frac{1}{6} = \frac{1}{t}$
6. $\frac{1}{4} + \frac{1}{6} = \frac{1}{t}$
7. $x + \frac{2}{x} = -3$
8. $x + \frac{5}{x} = -6$
9. $x - \frac{18}{x} = -3$
10. $x - \frac{12}{x} = 1$
11. $x - \frac{10}{x} = 3$
12. $x - \frac{21}{x} = 4$
13. $\frac{7}{4x} + \frac{2}{x} = 1$
14. $\frac{2}{x} + \frac{4}{3x} = 1$
15. $\frac{x-2}{x-6} = \frac{5}{3}$
16. $\frac{x-4}{x+8} = \frac{1}{3}$
17. $\frac{6}{x+3} = \frac{3}{x-1}$
18. $\frac{7}{x+14} = \frac{1}{x-10}$
19. $\frac{x}{6} - \frac{x}{8} = \frac{1}{3}$
20. $\frac{x}{4} - \frac{x}{10} = \frac{1}{4}$
21. $\frac{x+2}{4} - \frac{x-1}{3} = 1$
22. $\frac{x+1}{2} - \frac{x-1}{3} = 1$
23. $\frac{x-3}{x-4} = \frac{8}{x-4}$
24. $\frac{x+1}{x-3} = \frac{x-2}{x+3}$
25. $\frac{x+2}{x-5} = \frac{x+1}{x+5}$



Making Practice Fun 80 Name _____

Fractional Expressions and Equations—Solving Formulas

FACTS ABOUT ANIMALS

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Solve for the indicated letter.

1. $\frac{q}{P} + 1 = \frac{q}{f}; P$ $P = \frac{qf}{q - f}$ **A**
2. $\frac{1}{P} + \frac{1}{q} = \frac{1}{f}; q$
3. $\frac{at}{v} = 1 - \frac{V_0}{v}; v$
4. $\frac{V_0}{a} + t = \frac{v}{a}; a$
5. $n = \frac{pk + 1}{k - p}; p$
6. $x = w(A - \frac{q}{t}); t$
7. $\frac{y}{c} = 1 + \frac{y}{a}; y$
8. $x = A(w - \frac{t}{q}); t$
9. $\frac{V_0}{t} - a = \frac{v}{t}; a$
10. $n = \frac{pk + 1}{k - p}; k$
11. $\frac{1}{y} = \frac{1}{a} + \frac{1}{c}; y$
12. $\frac{1}{y} = \frac{1}{a} + \frac{1}{c}; a$
13. $\frac{a}{b} = \frac{c}{d}; d$
14. $\frac{w}{y} = \frac{Aw}{q} + \frac{x}{q}; y$
15. $M = -T(R - \frac{S}{K}); K$
16. $A = \frac{P}{1 - c}; c$
17. $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}; R_1$
18. $\frac{KM}{T} = S + KR; K$

What is the name for a group of . . .

oysters? $\frac{}{16}$ $\frac{}{6}$ $\frac{}{15}$

partridges? $\frac{}{16}$ $\frac{}{8}$ $\frac{A}{1}$ $\frac{}{13}$ $\frac{}{6}$

whales? $\frac{}{17}$ $\frac{A}{1}$ $\frac{}{4}$

seals? $\frac{}{3}$ $\frac{}{2}$ $\frac{}{15}$

mules? $\frac{}{11}$ $\frac{}{3}$ $\frac{A}{1}$ $\frac{}{12}$

kangaroos? $\frac{}{4}$ $\frac{}{2}$ $\frac{}{16}$

geese? $\frac{}{17}$ $\frac{A}{1}$ $\frac{}{17}$ $\frac{}{17}$ $\frac{}{18}$ $\frac{}{6}$

lions? $\frac{}{3}$ $\frac{}{8}$ $\frac{}{7}$ $\frac{}{15}$ $\frac{}{6}$

chicks? $\frac{}{13}$ $\frac{}{18}$ $\frac{}{10}$ $\frac{}{9}$ $\frac{}{13}$ $\frac{}{5}$

rhinoceroses? $\frac{}{13}$ $\frac{}{8}$ $\frac{A}{1}$ $\frac{}{11}$ $\frac{}{5}$

flies? $\frac{}{16}$ $\frac{}{10}$ $\frac{}{11}$ $\frac{}{7}$ $\frac{}{12}$ $\frac{}{6}$ $\frac{}{11}$ $\frac{}{11}$

toads? $\frac{}{14}$ $\frac{}{12}$ $\frac{}{2}$ $\frac{}{9}$

Code Letter	Answer
A	$\frac{qf}{q - f}$
B	$1 - \frac{P}{A}$
C	$\frac{bc}{a}$
D	$\frac{ST}{M + RT}$
E	$\frac{qw}{Aw - x}$
F	$\frac{RR_2}{R - R_2}$
G	$\frac{RR_2}{R_2 - R}$
H	$\frac{kn - 1}{k + n}$
I	$\frac{ac}{a - c}$
K	$\frac{qw}{Aw + x}$
L	$\frac{ST}{M - RT}$
M	$\frac{v - V_0}{t}$
N	$\frac{cy}{c - y}$
O	$\frac{Pf}{P - f}$
P	$V_0 + at$
R	$q(w - \frac{x}{A})$
S	$\frac{ac}{a + c}$
T	$\frac{V_0 - v}{t}$
U	$\frac{pn + 1}{n - p}$

 Name _____

Fractional Expressions and Equations—Solving Proportion Problems

DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Find the rate.

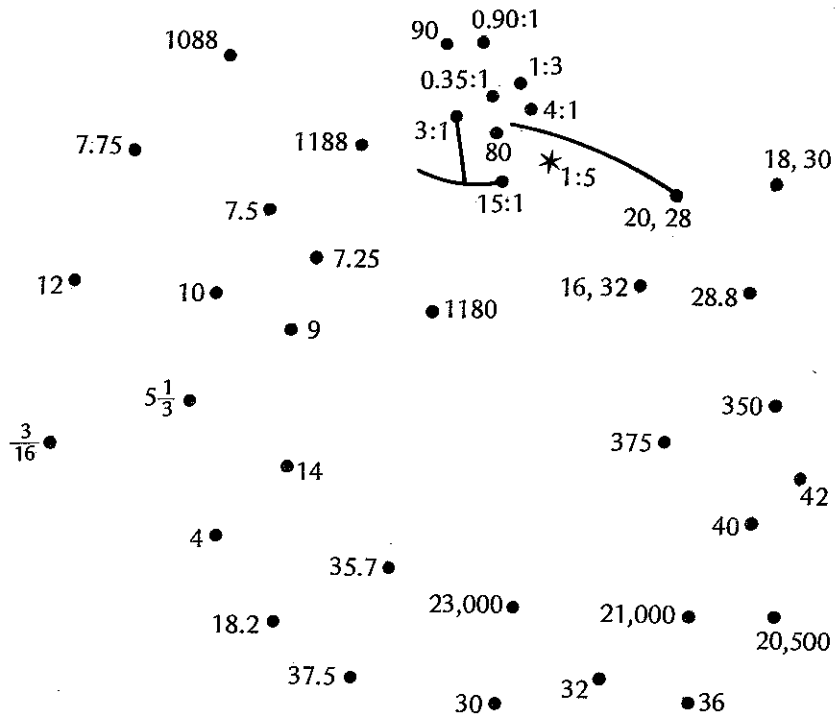
1. A secretary typed 12 letters in one hour. What is the rate in letters per minute? 1:5
2. A clerk filed 360 cards in 24 minutes. What is the rate in cards per minute?
3. A teacher drives 720 km in 9 hours. What is the speed in km/h?
4. A principal drives 600 km on 150 liters of gas. What is the rate in km/l?
5. A painter can paint 6 walls in 18 hours. What is the rate in walls per hour?
6. The price of sugar rose $1.40 in 4 months. What is the rate of increase per month?
7. The price of a share of a certain stock decreased $4.50 in 5 months. What is the rate of decrease per month?
8. A cheetah traveled 1.5 km in a minute. What is its speed in km/h?
9. A cook gained 12 kilograms in 4 months. What is the rate in kilograms per month?
10. The speed of sound in air is approximately 330 m/s. What is the speed in km/h?

Solve each proportion.

11. $\frac{18}{12} = \frac{x}{5}$
12. $\frac{16}{5} = \frac{32}{x}$
13. $\frac{4}{15} = \frac{x}{20}$
14. $\frac{x}{8} = \frac{3}{6}$
15. $\frac{13}{x} = \frac{3}{4.2}$
16. $\frac{10}{1.2} = \frac{x}{4.5}$

Solve.

17. The ratio of boys to girls in a class is 7 to 6. If there are 35 boys, how many girls are there?
18. A painter can paint an average of 8 walls in 3 days. At this rate, how many can he paint in 12 days?
19. A salesman bought a new car. In the first 4 months he drove it 7000 km. At this rate, how many km will he drive it at the end of a year?
20. A sample of 240 oranges contained 8 spoiled ones. How many spoiled oranges would you expect in a batch of 1200?
21. A recipe calls for 100 g of sugar for 2 dozen cookies. How much sugar would be required for 90 cookies?
22. It takes 2.4 kg of cocoa for 175 cups. How much cocoa is needed for 2100 cups?
23. Separate 48 into two parts that are in the ratio of 5 to 7.



Making Practice Fun 82 Name _____

Solving Problems Involving Direct or Inverse Variation

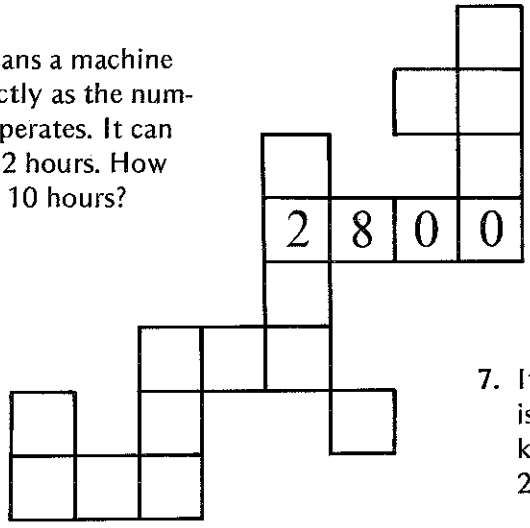
FILL IN THE NUMBERS PUZZLE

1. Work all the exercises first.
2. Fit the answers into the diagram, down or across, so that the digits match correctly.

Exercises

1. The number N of copies a machine can make varies directly as the number H of hours it operates. It can make 2000 copies in 15 hours. How many copies can it make in 21 hours? 2800

2. The number C of cans a machine can seal varies directly as the number H of hours it operates. It can seal 3900 cans in 12 hours. How many can it seal in 10 hours?



3. The distance d a spring is stretched by placing a weight on it varies directly as the weight w of the object. If the distance stretched is 30 cm when the weight is 8 kg, how far will the spring be stretched when the weight is 20 kg?

4. The electrical resistance R of 8-gauge copper wire varies directly as the length L of the wire. If a 2-km wire has a resistance of 4 ohms, what will be the resistance of a 3-km wire?

5. The power W produced in an electrical circuit is directly proportional to the current I that flows through the circuit. If a power of 750 watts is produced by a current of 9 amps, what power would be produced by a current of 6 amps?

6. The volume V of a gas varies inversely as the pressure P upon it. The volume of a gas is 300 cm^3 under a pressure of 48 kg/cm^2. What will be its volume under a pressure of 36 kg/cm^2?

7. If the volume of the gas in Exercise 6 is 750 cm^3 under a pressure of 15 kg/cm^2, what will be its volume under 25 kg/cm^2 pressure?

8. The current I in an electrical conductor varies inversely as the resistance R of the conductor. The current is 4 amps when the resistance is 280 ohms. What is the current when the resistance is 40 ohms?

9. The frequency F of a radio wave varies inversely as the length L of the wave. If a wave 75 m long has a frequency of 3000 kilocycles per second, what will be the frequency of a wave that is 125 m long?

Making Practice Fun 83

Name_____

Radical Expressions

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

Find the following.

1. $\sqrt{9} = 3$
2. $-\sqrt{36}$
3. $\sqrt{49}$
4. $-\sqrt{100}$
5. $\sqrt{1}$
6. $\sqrt{900}$
7. $\sqrt{225}$
8. $-\sqrt{169}$
9. $\sqrt{256}$
10. $-\sqrt{1}$
11. $-\sqrt{289}$
12. $\sqrt{144}$

Identify the radicand.

13. $\sqrt{a+3}$
14. $\sqrt{x-1}$
15. $6\sqrt{7x}$
16. $3\sqrt{x^2-1}$
17. $3\sqrt{\frac{2}{5}}$
18. $4\sqrt{\frac{x}{x+y}}$

Shade in the meaningless expressions.

19. $\sqrt{-9}$
20. $-\sqrt{100}$
21. $\sqrt{-5}$
22. $\sqrt{(-3)^2}$

Determine the nonsensible replacements.

23. $\sqrt{x}$
24. $\sqrt{y-8}$
25. $\sqrt{x+7}$
26. $\sqrt{3x+12}$
27. $\sqrt{3x-4}$
28. $\sqrt{2x+11}$

Simplify. Assume the expressions involving variables are non-negative.

29. $\sqrt{x^2}$
30. $\sqrt{m^2}$
31. $\sqrt{9a^2}$
32. $\sqrt{25y^2}$
33. $\sqrt{(-8)^2}$
34. $\sqrt{(-2b)^2}$
35. $\sqrt{(x-2)^2}$
36. $\sqrt{x^2+4x+4}$
37. $\sqrt{(x+5)^2}$
38. $\sqrt{4x^2+12x+9}$

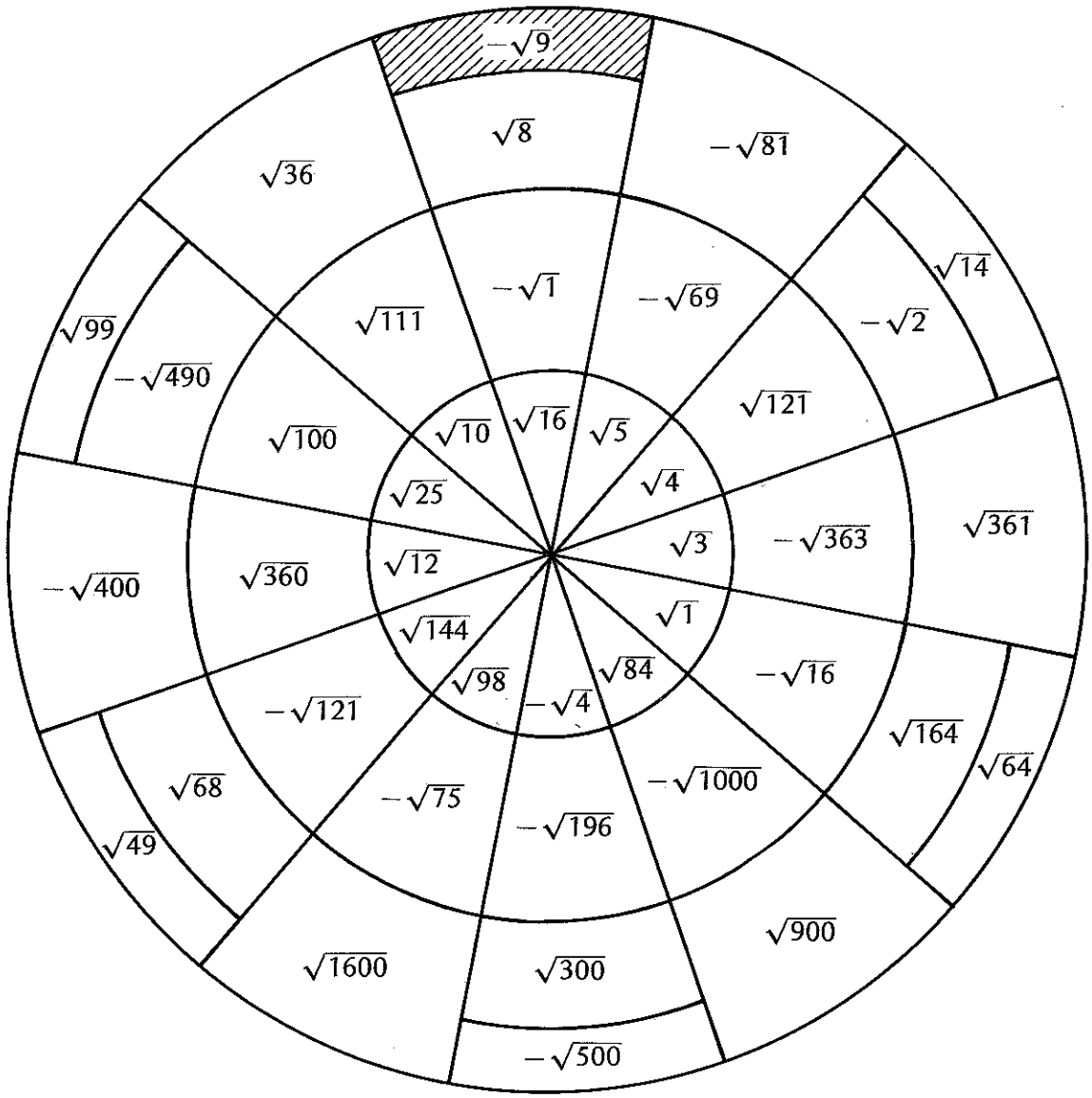
WHY	NOT	A	CIRCLE	ROOT	WHY	ONLY	SQUARE
15	$\frac{x}{x+y}$	-17	$x < \frac{4}{3}$	-6	$\sqrt{-5}$	-10	12
CAN	YOU	FIND	THE	MATH	TEAM	SOME	WHERE
$a+3$	$x < -\frac{11}{2}$	3	$x-1$	$x+5$	$-\sqrt{100}$	$y < 8$	$x < -4$
THIS	IS	SURELY	NOT	YOUR	MOST	DIFFICULT	PUZZLE
$x < 0$	1	8	$\sqrt{-9}$	$x < -12$	$3a$	$7x$	$x+2$
A	SQUARE	ROOT	FOR	A	FINE	MATH	STUDENT
30	m	$x-2$	$x < \frac{3}{4}$	7	-13	x	$2b$
ONE	SQUARE	ROOT	FOR	ONE	SQUARE	MATH	TREE
$5y$	$\frac{2}{5}$	x^2+25	$x < -7$	$2x+3$	-1	x^2-1	16

Making Practice Fun 84 Name _____

Radical Expressions—Identifying Rational and Irrational Numbers

DIAGRAM PUZZLE

Shade in each section containing a rational number.



Making Practice Fun 85 Name _____

Radical Expressions—Multiplying with Radical Notation

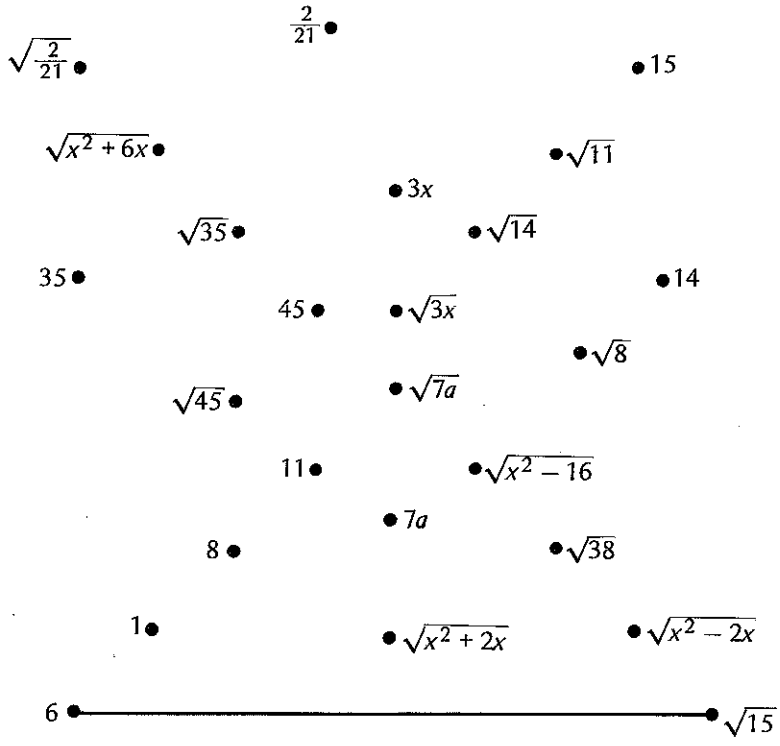
DIAGRAM PUZZLE

1. Work Exercise A1 and Exercise B1.
2. Draw a straight line segment connecting these two answers.
3. Continue with Exercise A2 and Exercise B2, and so on.

Exercises A

Multiply.

1. $\sqrt{3}\sqrt{5} = \sqrt{15}$
2. $\sqrt{2}\sqrt{7}$
3. $\sqrt{11}\sqrt{11}$
4. $\sqrt{\frac{11}{3}}\sqrt{3}$
5. $\sqrt{\frac{2}{3}}\sqrt{\frac{1}{7}}$
6. $\sqrt{3}\sqrt{x}$
7. $\sqrt{x-2}\sqrt{x}$
8. $\sqrt{x+6}\sqrt{x}$
9. $\sqrt{12}\sqrt{3}$
10. $\sqrt{1}\sqrt{38}$
11. $\sqrt{\frac{28}{3}}\sqrt{\frac{3}{2}}$
12. $\sqrt{\frac{x}{2}}\sqrt{2x+12}$
13. $\sqrt{12.1}\sqrt{10}$
14. $\sqrt{16}\sqrt{4}$
15. $\sqrt{\frac{3}{8}}\sqrt{\frac{8}{3}}$
16. $\sqrt{\frac{2}{5}}\sqrt{\frac{15x}{2}}$



Exercises B

Multiply.

1. $\sqrt{4}\sqrt{9} = 6$
2. $\sqrt{7}\sqrt{5}$
3. $\sqrt{81}\sqrt{25}$
4. $\sqrt{19}\sqrt{2}$
5. $\sqrt{15}\sqrt{15}$
6. $\sqrt{7}\sqrt{a}$
7. $\sqrt{75}\sqrt{3}$
8. $\sqrt{\frac{3}{7}}\sqrt{\frac{7}{3}}$
9. $\sqrt{\frac{2}{7}}\sqrt{\frac{1}{3}}$
10. $\sqrt{8}\sqrt{8}$
11. $\sqrt{x-4}\sqrt{x+4}$
12. $\sqrt{\frac{1}{8}}\sqrt{88}$
13. $\sqrt{\frac{x-4}{2}}\sqrt{2x+8}$
14. $\sqrt{\frac{7}{4}}\sqrt{20}$
15. $\sqrt{\frac{x}{3}}\sqrt{3x-6}$
16. $\sqrt{45}\sqrt{45}$

Making Practice Fun 86 Name_____

Radical Expressions—Factoring, Approximating Square Roots

DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

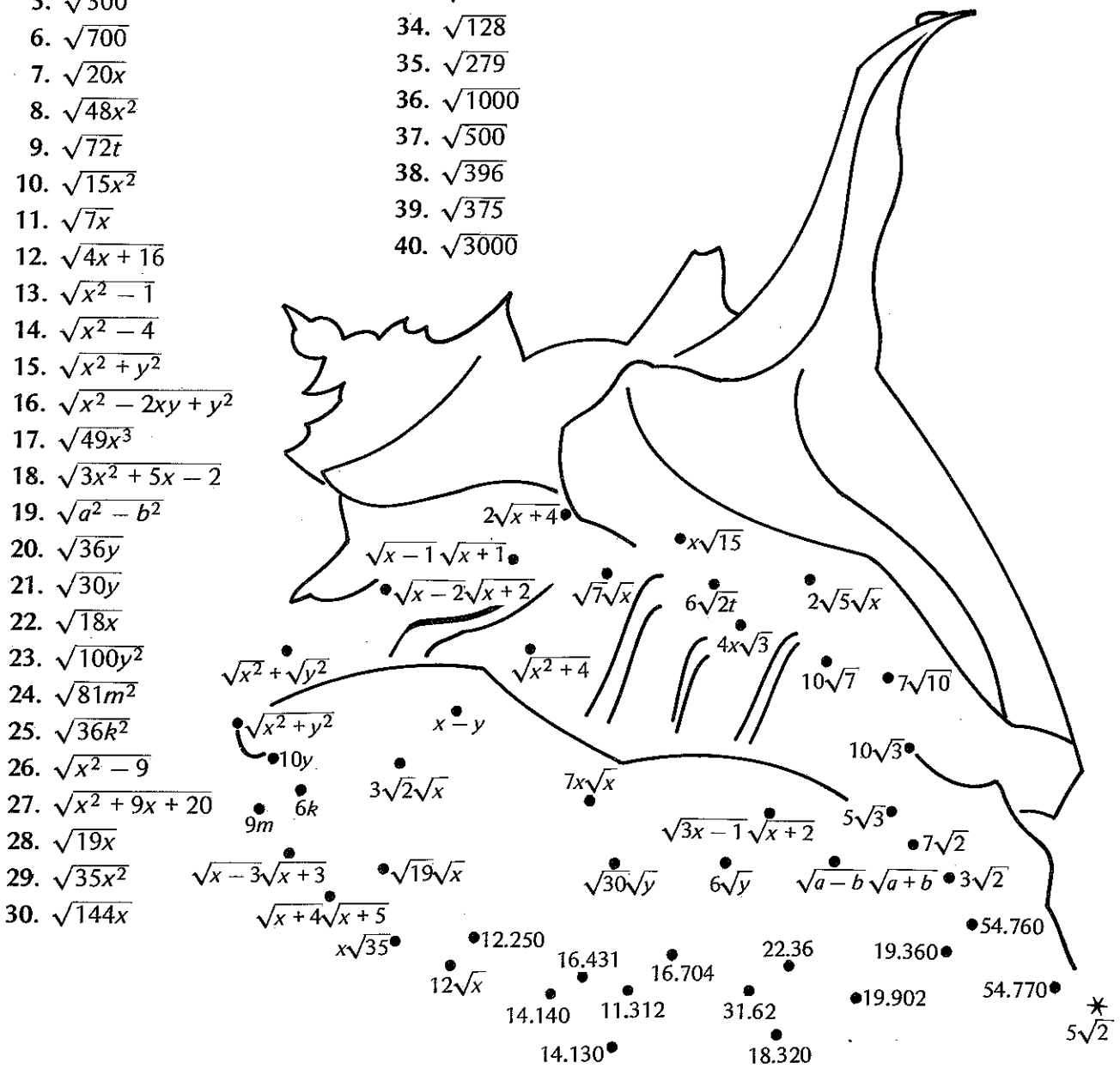
Exercises

Factor and simplify.

1. $\sqrt{50} = 5\sqrt{2}$
2. $\sqrt{18}$
3. $\sqrt{98}$
4. $\sqrt{75}$
5. $\sqrt{300}$
6. $\sqrt{700}$
7. $\sqrt{20x}$
8. $\sqrt{48x^2}$
9. $\sqrt{72t}$
10. $\sqrt{15x^2}$
11. $\sqrt{7x}$
12. $\sqrt{4x + 16}$
13. $\sqrt{x^2 - 1}$
14. $\sqrt{x^2 - 4}$
15. $\sqrt{x^2 + y^2}$
16. $\sqrt{x^2 - 2xy + y^2}$
17. $\sqrt{49x^3}$
18. $\sqrt{3x^2 + 5x - 2}$
19. $\sqrt{a^2 - b^2}$
20. $\sqrt{36y}$
21. $\sqrt{30y}$
22. $\sqrt{18x}$
23. $\sqrt{100y^2}$
24. $\sqrt{81m^2}$
25. $\sqrt{36k^2}$
26. $\sqrt{x^2 - 9}$
27. $\sqrt{x^2 + 9x + 20}$
28. $\sqrt{19x}$
29. $\sqrt{35x^2}$
30. $\sqrt{144x}$

Approximate these square roots. Round to three decimal places.

31. $\sqrt{150}$
32. $\sqrt{200}$
33. $\sqrt{270}$
34. $\sqrt{128}$
35. $\sqrt{279}$
36. $\sqrt{1000}$
37. $\sqrt{500}$
38. $\sqrt{396}$
39. $\sqrt{375}$
40. $\sqrt{3000}$



Making Practice Fun 87 Name _____

Radical Expressions—Multiplying, Simplifying

FACTS ABOUT YOUNG ANIMALS

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Multiply and simplify.

1. $\sqrt{5}\sqrt{15} = 5\sqrt{3}$ R
2. $\sqrt{8}\sqrt{3}$
3. $\sqrt{7}\sqrt{14}$
4. $\sqrt{11}\sqrt{11}$
5. $\sqrt{10}\sqrt{2}$
6. $\sqrt{6}\sqrt{8}$
7. $\sqrt{12}\sqrt{8}$
8. $\sqrt{18}\sqrt{3}$
9. $\sqrt{22}\sqrt{\frac{11}{2}}$
10. $\sqrt{5a}\sqrt{10b}$
11. $\sqrt{7a}\sqrt{7a}$
12. $\sqrt{3x^2y}\sqrt{2y}$
13. $\sqrt{12ab^2}\sqrt{3ab}$
14. $\sqrt{14x^3y^4}\sqrt{21x}$
15. $\sqrt{30a}\sqrt{6ab}$
16. $\sqrt{3}\sqrt{25}$
17. $\sqrt{14xy^2}\sqrt{21x^2y}$
18. $\sqrt{8ab}\sqrt{8a}$
19. $\sqrt{12}\sqrt{6}$
20. $\sqrt{26x^3y^5}\sqrt{13x^2y}$
21. $\sqrt{x^2}\sqrt{6y^2}$
22. $\sqrt{x-1}\sqrt{2x-2}$
23. $\sqrt{75ab}\sqrt{5a}$
24. $\sqrt{3x-9}\sqrt{6x-18}$

What is the name of a young . . .

kangaroo? $\overline{13}\ \overline{5}\ \overline{12}\ \overline{6}$

hare? $\overline{15}\ \overline{21}\ \overline{9}\ \overline{21}\ \overset{R}{\overline{1}}\ \overline{12}\ \overline{8}$

salmon? $\overline{10}\ \overline{2}\ \overline{16}\ \overline{16}$

pigeon? $\overline{20}\ \overline{14}\ \overline{7}\ \overline{2}\ \overline{18}$

swan? $\overline{23}\ \overline{6}\ \overline{3}\ \overline{11}\ \overline{21}\ \overline{8}$

quail? $\overline{23}\ \overline{22}\ \overline{12}\ \overline{21}\ \overline{10}\ \overline{12}\ \overline{16}$

eel? $\overline{12}\ \overline{15}\ \overline{4}\ \overline{21}\ \overline{16}$

harp seal? $\overline{19}\ \overline{22}\ \overline{17}\ \overline{8}\ \overline{12}\ \overline{23}\ \overline{5}\ \overline{2}\ \overline{8}$

squirrel? $\overline{20}\ \overline{10}\ \overline{5}\ \overline{23}\ \overline{24}$

beaver? $\overline{24}\ \overline{17}\ \overline{8}$

hawk? $\overline{21}\ \overline{6}\ \overline{2}\ \overline{20}$

Code Letter	Simplified Answer
A	$2\sqrt{6}$
B	$8a\sqrt{b}$
C	$5a\sqrt{15b}$
D	$6ab\sqrt{5}$
E	$xy\sqrt{6}$
F	$3\sqrt{5}$
G	$7\sqrt{2}$
H	$(x-1)\sqrt{2}$
I	$7xy\sqrt{6xy}$
J	$6ab\sqrt{b}$
K	$3(x-3)\sqrt{2}$
L	$6a\sqrt{5b}$
M	$13x^2y\sqrt{2xy}$
N	$7a$
O	$2\sqrt{5}$
P	$5\sqrt{2ab}$
Q	$7x^2y^2\sqrt{6}$
R	$5\sqrt{3}$
S	$13x^2y^3\sqrt{2x}$
T	$3\sqrt{6}$
U	$4\sqrt{6}$
V	11
W	$6\sqrt{2}$
Y	$4\sqrt{3}$

Making Practice Fun 88 Name_____

Radical Expressions—Simplifying Fractional Radicands, Approximating Square Roots of Fractions

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

Simplify.

1. $\sqrt{\frac{16}{25}} = \frac{4}{5}$
2. $\sqrt{\frac{49}{36}}$
3. $\sqrt{\frac{100}{81}}$
4. $\sqrt{\frac{1}{9}}$
5. $-\sqrt{\frac{4}{81}}$
6. $-\sqrt{\frac{1}{100}}$
7. $\sqrt{\frac{8}{9}}$
8. $\sqrt{\frac{8}{18}}$
9. $\sqrt{\frac{288}{50}}$
10. $\sqrt{\frac{25}{x^2}}$
11. $-\sqrt{\frac{36}{a^2}}$
12. $-\sqrt{\frac{50}{2}}$
13. $\sqrt{\frac{a^2b^2}{c^2}}$
14. $\sqrt{\frac{9a^2c}{b^2}}$
15. $\sqrt{\frac{250}{490}}$
16. $\sqrt{\frac{x^2}{900}}$
17. $\sqrt{\frac{x^2y^2}{16}}$
18. $\sqrt{\frac{1690}{2250}}$
19. $\sqrt{\frac{4x^2}{9y^2}}$
20. $\sqrt{\frac{w^2}{100a^2}}$
21. $\sqrt{\frac{3}{5}}$
22. $\sqrt{\frac{2}{3}}$
23. $\sqrt{\frac{1}{18}}$
24. $\sqrt{\frac{1}{5}}$
25. $\sqrt{\frac{3}{x}}$
26. $\sqrt{\frac{x}{y}}$

Approximate to three places.

27. $\sqrt{\frac{1}{3}}$
28. $\sqrt{\frac{1}{2}}$
29. $\sqrt{\frac{2}{5}}$
30. $\sqrt{1\frac{1}{3}}$
31. $\sqrt{3\frac{2}{3}}$

W $3\frac{a}{b}\sqrt{c}$	**R** $\frac{1}{3}\sqrt{6}$	**S** $\frac{2}{3}\sqrt{6}$	**S** $\frac{12}{5}$	**L** $\frac{xy}{4}$	**Y** $-\frac{1}{10}$	**O** $-\frac{6}{a}$	**H** $\frac{1}{3}$
I $-\frac{2}{9}$	**O** 0.707	**P** 1.153	**U** 0.576	**P** $\frac{1}{y}\sqrt{x^2y}$	**T** -5	**I** $\frac{1}{x}\sqrt{3}$	**L** $\frac{a}{b}\sqrt{c}$
S $\frac{2}{3}\sqrt{2}$	**P** $\frac{ab}{c}$	**U** $\frac{1}{5}\sqrt{5}$	**P** $\frac{4}{5}$	**P** 0.717	**I** $\frac{2x}{3y}$	**L** $\frac{1}{6}\sqrt{2}$	**O** 0.577
E $\frac{x}{30}$	**W** 1.155	**P** $\frac{5}{x}$	**E** $\frac{1}{x}\sqrt{3x}$	**H** $\frac{5}{7}$	**E** 1.913	**Y** $\frac{1}{y}\sqrt{xy}$	**W** $\frac{13}{15}$
S 1.915	**U** $\frac{10}{9}$	**T** $\frac{1}{5}\sqrt{15}$	**N** $\frac{2}{3}$	**E** $\frac{w}{10a}$	**R** $\frac{7}{6}$	**R** 0.639	**S** 0.632

Making Practice Fun 89 Name _____

Radical Expressions—Adding, Subtracting

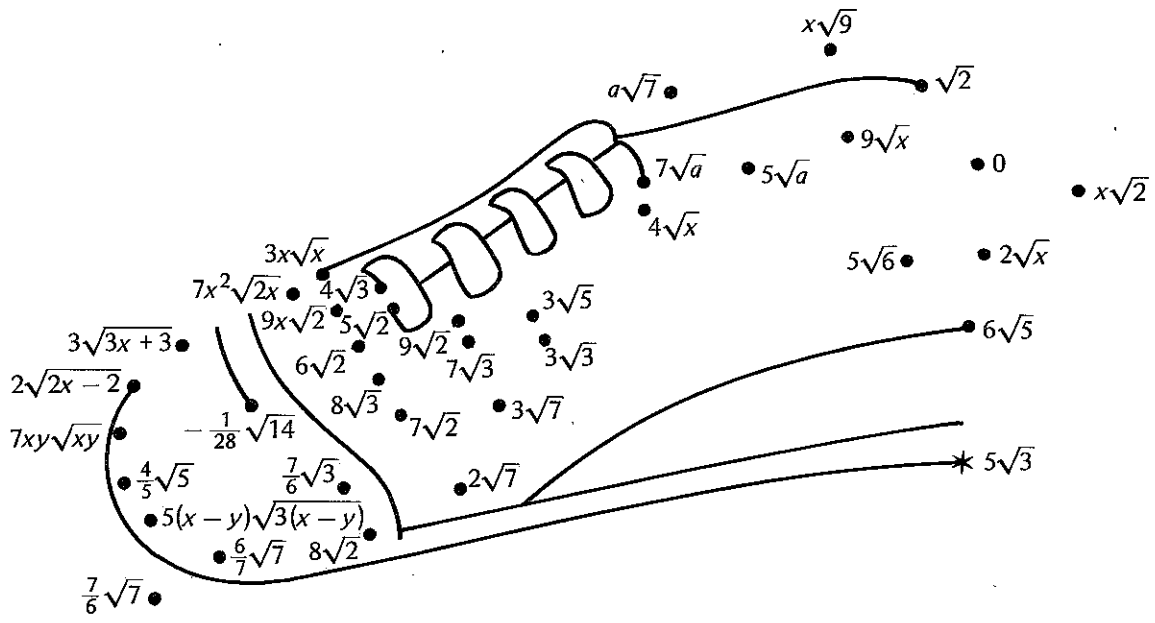
DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

Add or subtract.

1. $2\sqrt{3} + 3\sqrt{3} = 5\sqrt{3}$
2. $8\sqrt{5} - 2\sqrt{5}$
3. $\sqrt{x} + \sqrt{x}$
4. $3\sqrt{3} - \sqrt{27}$
5. $7\sqrt{2} - 6\sqrt{2}$
6. $3\sqrt{x} + 6\sqrt{x}$
7. $4\sqrt{a} + \sqrt{a}$
8. $11\sqrt{a} - 4\sqrt{a}$
9. $13\sqrt{x} - 9\sqrt{x}$
10. $3\sqrt{8} + 3\sqrt{2}$
11. $5\sqrt{12} - 3\sqrt{3}$
12. $\sqrt{125} - \sqrt{20}$
13. $\sqrt{75} - \sqrt{12}$
14. $\sqrt{8} + \sqrt{50}$
15. $\sqrt{300} - \sqrt{12}$
16. $\sqrt{98} - \sqrt{2}$
17. $3\sqrt{8} + \sqrt{18} - \sqrt{32}$
18. $2\sqrt{27} + \sqrt{12} - \sqrt{48}$
19. $\sqrt{72x^2} + \sqrt{18x^2}$
20. $\sqrt{100x^3} - \sqrt{49x^3}$
21. $\sqrt{8x^5} + \sqrt{50x^5}$
22. $\sqrt{12x + 12} + \sqrt{3x + 3}$
23. $\sqrt{18x - 18} - \sqrt{2x - 2}$
24. $5x\sqrt{xy^3} + 2y\sqrt{x^3y}$
25. $\sqrt{5} - \sqrt{\frac{1}{5}}$
26. $\sqrt{27(x-y)^3} + \sqrt{12(x-y)^3}$
27. $\sqrt{7} - \sqrt{\frac{1}{7}}$
28. $3\sqrt{2} + 10\sqrt{\frac{1}{2}}$
29. $\sqrt{\frac{3}{4}} + \sqrt{\frac{4}{3}}$
30. $\sqrt{\frac{7}{8}} - \sqrt{\frac{8}{7}}$



Making Practice Fun 90 Name _____

Radical Expressions—Dividing, Rationalizing Denominators

FACTS ABOUT NOBEL PRIZES

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Code Letter	Simplified Answer
A	6
B	$\sqrt{7}$
C	$\frac{x\sqrt{3y}}{y}$
D	$\frac{1}{5}$
E	3
F	$\frac{2}{15}\sqrt{10}$
G	$5x$
H	$\frac{1}{8}$
I	$\sqrt{6}$
J	$\frac{1}{7}$
K	$\sqrt{3}$
L	$2\sqrt{3}$
M	$\frac{1}{3}\sqrt{6}$
N	9
O	$\frac{6}{5}$
P	$5x^2$
R	$\frac{1}{4}$
S	$\frac{2}{3}\sqrt{3}$
T	$\frac{3}{4}$
U	7
V	$\frac{\sqrt{xy}}{y}$
W	$\frac{2}{5}\sqrt{5}$
Y	$\frac{1}{7}\sqrt{14}$

Exercises

Divide and simplify.

1. $\frac{\sqrt{30}}{\sqrt{5}} = \sqrt{6}$ I
2. $\frac{\sqrt{14}}{\sqrt{2}}$
3. $\frac{\sqrt{98}}{\sqrt{2}}$
4. $\frac{\sqrt{243}}{\sqrt{3}}$
5. $\frac{\sqrt{180}}{\sqrt{5}}$
6. $\frac{\sqrt{21}}{\sqrt{7}}$
7. $\frac{\sqrt{2}}{\sqrt{32}}$
8. $\frac{\sqrt{5}}{\sqrt{125}}$
9. $\frac{\sqrt{72}}{\sqrt{50}}$
10. $\frac{\sqrt{18x}}{\sqrt{2x}}$
11. $\frac{\sqrt{75x^5}}{\sqrt{3x}}$
12. $\frac{\sqrt{144x^3}}{\sqrt{4x^3}}$
13. $\frac{\sqrt{12x^3}}{\sqrt{4xy}}$
14. $\frac{\sqrt{162A}}{\sqrt{2A}}$
15. $\frac{4\sqrt{x}}{3\sqrt{10x}}$
16. $\frac{\sqrt{\frac{2}{3}}}{\sqrt{\frac{5}{6}}}$
17. $\frac{\sqrt{\frac{3}{4}}}{\sqrt{\frac{4}{3}}}$
18. $\frac{\sqrt{175x^3}}{\sqrt{7x}}$
19. $\frac{\sqrt{\frac{1}{8}}}{\sqrt{8}}$
20. $\frac{\sqrt{3}}{\sqrt{\frac{1}{2}}}$
21. $\frac{\sqrt{2}}{\sqrt{7}}$
22. $\frac{\sqrt{2}}{\sqrt{3}}$
23. $\frac{6}{\sqrt{3}}$
24. $\frac{\sqrt{x}}{\sqrt{y}}$
25. $\frac{2}{7}\sqrt{\frac{49}{196}}$
26. $\frac{2\sqrt{150}}{15\sqrt{2}}$

Who won the Nobel Prize . . .

in Physics in 1971? $\frac{}{8}\ \frac{}{10}\ \frac{}{4}\ \frac{}{14}\ \frac{\text{I}}{1}\ \frac{}{26}\ \ \frac{}{18}\ \frac{}{5}\ \frac{}{2}\ \frac{}{9}\ \frac{}{7}$ (British)

in Peace in 1975? $\frac{}{5}\ \frac{}{14}\ \frac{}{8}\ \frac{}{7}\ \frac{}{10}\ \frac{\text{I}}{1}\ \ \frac{}{26}\ \frac{}{5}\ \frac{}{6}\ \frac{}{19}\ \frac{}{5}\ \frac{}{7}\ \frac{}{9}\ \frac{}{24}$ (Russian)

in Literature in 1954? $\frac{}{10}\ \frac{}{7}\ \frac{}{14}\ \frac{}{10}\ \frac{}{26}\ \frac{}{17}\ \ \frac{}{19}\ \frac{}{10}\ \frac{}{22}\ \frac{}{20}\ \frac{}{14}\ \frac{}{18}\ \frac{}{16}\ \frac{}{12}\ \frac{}{21}$ (American)

in Chemistry in 1954? $\frac{}{23}\ \frac{}{20}\ \frac{}{4}\ \frac{}{3}\ \frac{}{26}\ \ \frac{}{11}\ \frac{}{5}\ \frac{}{3}\ \frac{}{23}\ \frac{\text{I}}{1}\ \frac{}{14}\ \frac{}{18}$ (American)

in Medicine—Physiology in 1962? $\frac{}{15}\ \frac{}{7}\ \frac{}{5}\ \frac{}{4}\ \frac{}{13}\ \frac{}{20}\ \frac{}{26}\ \ \frac{}{13}\ \frac{}{7}\ \frac{\text{I}}{1}\ \frac{}{13}\ \frac{}{6}$ (British)

$\frac{}{25}\ \frac{}{12}\ \frac{}{22}\ \frac{}{10}\ \frac{}{26}\ \ \frac{}{16}\ \frac{}{5}\ \frac{}{17}\ \frac{}{26}\ \frac{}{9}\ \frac{}{4}$ (American)

$\frac{}{22}\ \frac{}{5}\ \frac{}{3}\ \frac{}{7}\ \frac{}{20}\ \frac{}{13}\ \frac{}{10}\ \ \frac{}{16}\ \frac{\text{I}}{1}\ \frac{}{23}\ \frac{}{6}\ \frac{}{20}\ \frac{}{4}\ \frac{}{26}$ (British)

Making Practice Fun 91

Name_____

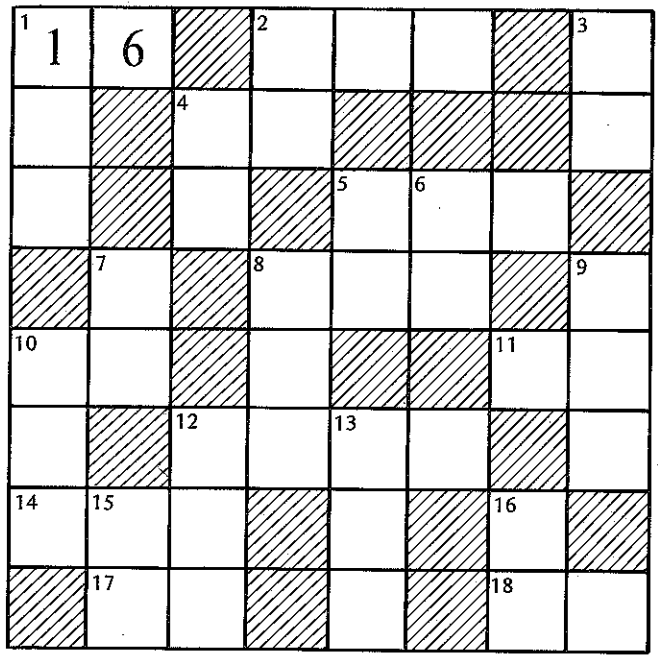
Solving Equations with Radicals

CROSS NUMBER PUZZLE

1. Work each exercise.
2. Write the answer in the correct squares.

Across

1. $\sqrt{x} = 4 \quad x = 16$
2. $\sqrt{x} = 15$
3. $x = \sqrt{0.01}$
4. $\sqrt{x - 10} = 5$
5. $\sqrt{x - 15} = 12$
8. $\sqrt{x - 14} = 11$
9. $3\sqrt{x} = 6$
10. $2\sqrt{x - 4} = 6$
11. $4\sqrt{x + 6} = 24$
12. $\frac{\sqrt{x - 412}}{6} = 5$
14. $2\sqrt{x - 75} = 14$
17. $5\sqrt{x - 22} = 5$
18. $3\sqrt{2x - 9} = 21$



Down

1. $\sqrt{x} = 10$
2. $\sqrt{x} = 5$
3. $x = \sqrt{0.0144}$
4. $\sqrt{x - 1} = 6$
5. $\sqrt{2x + 23} = 7$
6. $\sqrt{3x - 65} = 10$
7. $2\sqrt{x + 7} = 20$
8. $3\sqrt{x - 4} = 39$
9. $\frac{\sqrt{x}}{5} = 4$
10. $\frac{\sqrt{x + 3}}{2} = 6$
12. $\frac{\sqrt{x - 62}}{9} = 1$
13. $\frac{\sqrt{x}}{8} = \frac{3}{2}$
15. $2\sqrt{3x - 2} = 16$
16. $3\sqrt{2x} = 24$

Making Practice Fun 92 Name_____

Quadratic Equations—Solving Equations of the Type $ax^2 = k$, $a \neq 0$

SECRET MESSAGE

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Solve.

1. $x^2 = 9 \quad x = 3, -3$ E
2. $x^2 = 81$
3. $x^2 = 64$
4. $x^2 = 100$
5. $x^2 = 121$
6. $x^2 = 169$
7. $x^2 = 5$
8. $x^2 = 3$
9. $3x^2 = 21$
10. $2x^2 = 20$
11. $3x^2 = 300$
12. $5x^2 = 40$
13. $9x^2 - 25 = 0$
14. $4x^2 - 36 = 0$
15. $4x^2 = 48$
16. $5x^2 - 75 = 0$
17. $2x^2 - 162 = 0$
18. $5x^2 - 45 = 0$
19. $3x^2 - 15 = 0$
20. $x^2 - 15 = 66$
21. $7x^2 - 63 = 0$
22. $x^2 - 11 = 70$
23. $18x^2 - 50 = 0$
24. $7x^2 - 25 = 0$
25. $3x^2 - 36 = 0$
26. $14x^2 - 50 = 0$
27. $7x^2 - 56 = 0$
28. $4y^2 - 5 = 39$
29. $8x^2 - 21 = 51$
30. $6x^2 - 6 = 0$
31. $2x^2 + 18 = 40$
32. $x^2 - 75 = 94$
33. $4x^2 - 20 = 0$

Code Letter	Answers
A	$\sqrt{11}, -\sqrt{11}$
B	$\sqrt{2}, -\sqrt{2}$
C	$\frac{5}{3}, -\frac{5}{3}$
D	$\sqrt{10}, -\sqrt{10}$
E	$3, -3$
F	$11, -11$
G	$2\sqrt{2}, -2\sqrt{2}$
H	$13, -13$
I	$10, -10$
K	$\frac{\sqrt{7}}{5}, -\frac{\sqrt{7}}{5}$
L	$8, -8$
M	$1, -1$
N	$15, -15$
O	$\sqrt{3}, -\sqrt{3}$
P	$7, -7$
R	$9, -9$
S	$\frac{5\sqrt{7}}{7}, -\frac{5\sqrt{7}}{7}$
T	$\sqrt{5}, -\sqrt{5}$
U	$2\sqrt{3}, -2\sqrt{3}$
V	$\sqrt{7}, -\sqrt{7}$
W	$5\sqrt{3}, -5\sqrt{3}$
Y	$\sqrt{15}, -\sqrt{15}$

You'll get a charge out of this!

12	11	9	E 1	16	8	15	17	24	14	3	5	

13	20	18	10	4	19	.	25	26	14

30	28	33	32	7	29	22	23	6	31	2	27	21	.

Making Practice Fun 93 Name_____

Quadratic Equations—Solving by Factoring

INFORMATION TIME

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

Solve.

1. $x^2 + 5x = 0$ $0, -5$
2. $2x^2 + 8x = 0$
3. $6x^2 + 18x = 0$
4. $3x^2 - 21x = 0$
5. $7x^2 - 42x = 0$
6. $3x^2 + 3x = 0$
7. $2x^2 - 2x = 0$
8. $2x^2 - 30x = 0$
9. $3x^2 + 4x = 0$
10. $15x^2 - 10x = 0$
11. $11x^2 + 13x = 0$
12. $2x^2 - 7x = 0$
13. $3x^2 + 8x = 0$
14. $6x^2 - 10x = 0$
15. $14x^2 - 28x = 0$
16. $x^2 + 4x - 21 = 0$
17. $x^2 - 11x + 18 = 0$
18. $x^2 + x - 30 = 0$
19. $x^2 + 2x + 1 = 0$
20. $x^2 + 14x - 32 = 0$
21. $x^2 + 8x - 9 = 0$
22. $x^2 - 13x + 30 = 0$
23. $x^2 - 13x - 30 = 0$
24. $x^2 - x - 72 = 0$
25. $x^2 + 9x - 36 = 0$
26. $6x^2 - 7x - 3 = 0$
27. $10x^2 - 3x - 1 = 0$
28. $6x^2 + 7x - 20 = 0$
29. $21x^2 - 2x - 3 = 0$
30. $x(x - 4) = 12$
31. $x(x + 6) = 27$
32. $8x^2 + 3x + 1 = 3x^2 - 3x$
33. $2x^2 + 3x = 6x + x^2 + 28$

Calcium is the most common mineral found in bone. Who discovered calcium and in what year was it discovered?

CURIE $0, \frac{2}{3}$	1808 $\frac{1}{5}, 1$	1816 $9, -8$	1809 $0, -5$	1812 $0, 2$	LAWSON $-\frac{1}{3}, \frac{3}{2}$	DAVY $-7, 4$
DE FOE $0, 15$	EINSTEIN $-12, 3$	1813 $0, -\frac{8}{3}$	1801 $0, -\frac{4}{3}$	1793 $-6, 5$	CALCES $0, -1$	1802 $2, -16$
VASHER $-\frac{1}{5}, -1$	GROENER $0, -4$	DOPPER $7, -4$	SCHMIDT $6, -2$	FRANK $10, 3$	1912 $\frac{1}{2}, -\frac{1}{5}$	1733 $0, -3$
MERKS $-9, 1$	HYDE $3, -9$	1837 $\frac{4}{3}, -\frac{5}{2}$	1880 $0, 6$	1844 $9, 2$	TAI $15, -2$	ROBERTS $0, -\frac{13}{11}$
FARLEY $0, \frac{5}{3}$	KOONCE $-1, -1$	1811 $0, 7$	GAUDET $0, \frac{7}{2}$	HIXSON $-7, 3$	1618 $\frac{3}{7}, -\frac{1}{3}$	1798 $0, 1$

Making Practice Fun 94 Name_____

Quadratic Equations—Solving Equations of the Type $(x + k)^2 = d$

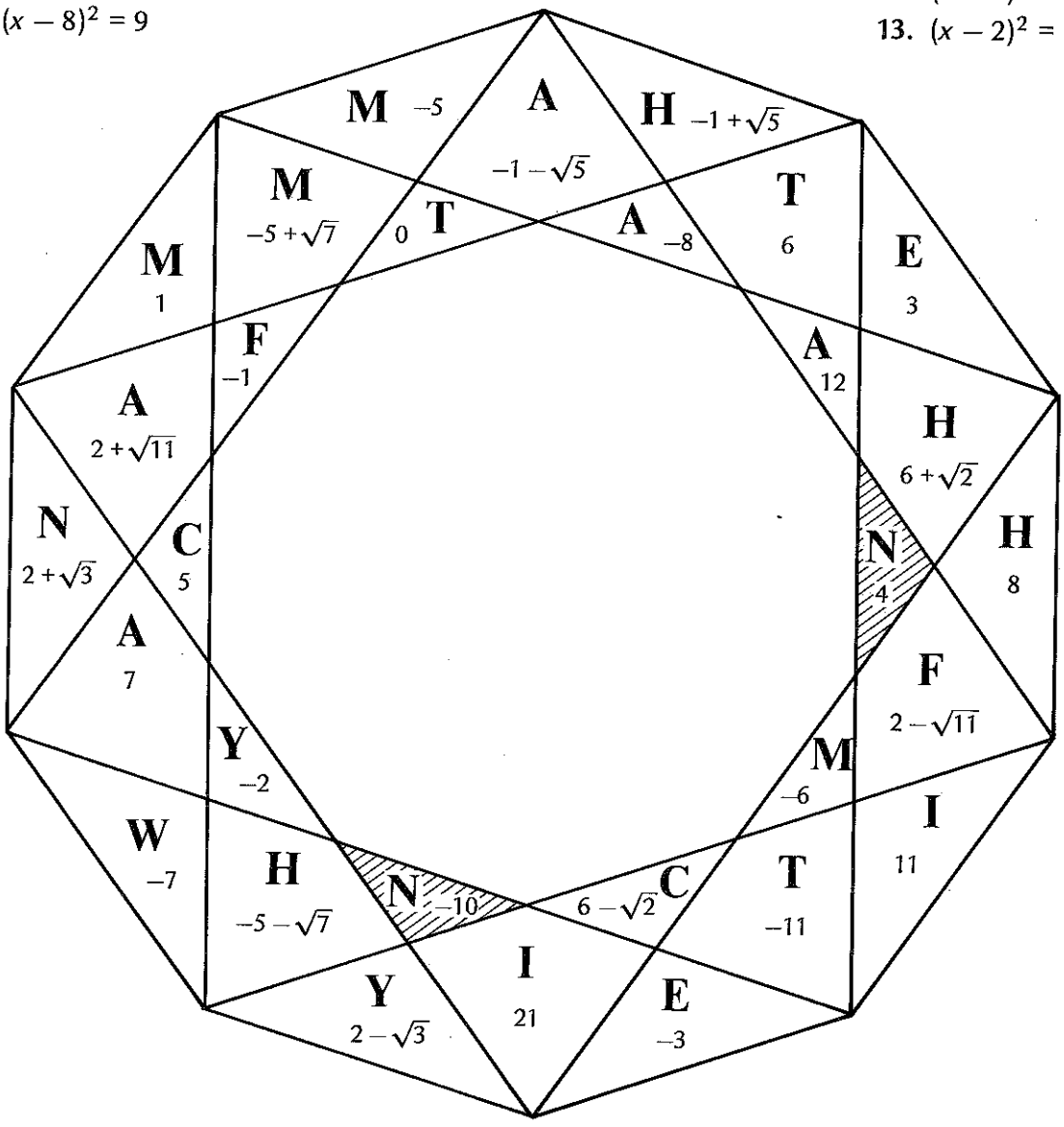
HIDDEN MESSAGE

1. Work each exercise.
2. Find both solutions on the diagram.
3. Shade in both regions that contain those answers.
4. Read the message in the unshaded regions.

Exercises

Solve.

1. $(x + 3)^2 = 49$ 4, −10
2. $(x + 2)^2 = 25$
3. $(x + 4)^2 = 1$
4. $(x - 6)^2 = 36$
5. $(x - 8)^2 = 9$
6. $(x - 10)^2 = 121$
7. $(x - 2)^2 = 16$
8. $(x + 7)^2 = 1$
9. $(x + 5)^2 = 7$
10. $(x - 2)^2 = 3$
11. $(x + 1)^2 = 5$
12. $(x - 6)^2 = 2$
13. $(x - 2)^2 = 11$



Making Practice Fun 95 Name_____

Quadratic Equations—Solving by Completing the Square

FACTS ABOUT CAPITALS

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Solve.

1. $x^2 - 4x - 12 = 0$ 6, –2 L
2. $x^2 - 4x - 21 = 0$
3. $x^2 + 4x - 32 = 0$
4. $x^2 + 4x - 12 = 0$
5. $x^2 + 2x - 5 = 0$
6. $x^2 - 2x - 1 = 0$
7. $x^2 + 5x - 14 = 0$
8. $x^2 + 7x - 8 = 0$
9. $x^2 - 2x - 4 = 0$
10. $x^2 + 8x - 2 = 0$
11. $x^2 - 2x - 6 = 0$
12. $x^2 - 4x - 8 = 0$
13. $x^2 - 6x - 2 = 0$
14. $x^2 - 2x - 2 = 0$
15. $x^2 - 6x - 8 = 0$
16. $x^2 - 10x - 2 = 0$
17. $x^2 + 2x - 10 = 0$
18. $x^2 + 6x - 16 = 0$
19. $x^2 + 6x - 12 = 0$
20. $2x^2 + 9x + 10 = 0$
21. $3x^2 + 2x - 1 = 0$
22. $2x^2 + 16x + 32 = 0$
23. $x^2 + 4x - 14 = 0$
24. $x^2 - 4x - 14 = 0$
25. $x^2 + 6x - 2 = 0$
26. $x^2 + 12x + 20 = 0$

Code Letter	Answers
A	$1 \pm \sqrt{7}$
B	$1 \pm \sqrt{3}$
C	$1 \pm \sqrt{2}$
D	–8, 2
E	$-\frac{5}{2}$, –2
F	$5 \pm 3\sqrt{3}$
G	–8, 1
H	4, –8
I	$3 \pm \sqrt{17}$
J	$3 \pm \sqrt{11}$
K	$-3 \pm \sqrt{21}$
L	6, –2
M	–4, –4
N	$1 \pm \sqrt{5}$
O	$-1 \pm \sqrt{11}$
P	$-1 \pm \sqrt{6}$
Q	$-4 \pm 3\sqrt{2}$
R	–6, 2
S	$2 \pm 3\sqrt{2}$
T	7, –3
U	–10, –2
V	$2 \pm 2\sqrt{3}$
W	–7, 2
X	$\frac{1}{3}$, –1
Y	$-3 \pm \sqrt{11}$
Z	$-2 \pm 3\sqrt{2}$

What is the capital of . . .

India? $\frac{}{9}\ \frac{}{20}\ \frac{}{7}\ \ \frac{}{18}\ \frac{}{20}\ \frac{L}{1}\ \frac{}{3}\ \frac{}{15}$

Peru? $\frac{L}{1}\ \frac{}{15}\ \frac{}{22}\ \frac{}{11}$

Jamaica? $\frac{}{19}\ \frac{}{15}\ \frac{}{9}\ \frac{}{8}\ \frac{}{24}\ \frac{}{2}\ \frac{}{17}\ \frac{}{9}$

Phillipines? $\frac{}{10}\ \frac{}{26}\ \frac{}{20}\ \frac{}{23}\ \frac{}{17}\ \frac{}{9}\ \ \frac{}{6}\ \frac{}{15}\ \frac{}{2}\ \frac{}{25}$

Indonesia? $\frac{}{13}\ \frac{}{11}\ \frac{}{19}\ \frac{}{11}\ \frac{}{4}\ \frac{}{2}\ \frac{}{11}$

Barbados? $\frac{}{14}\ \frac{}{4}\ \frac{}{15}\ \frac{}{18}\ \frac{}{8}\ \frac{}{20}\ \frac{}{2}\ \frac{}{17}\ \frac{}{7}\ \frac{}{9}$

Fiji? $\frac{}{24}\ \frac{}{26}\ \frac{}{12}\ \frac{}{11}$

Mexico? $\frac{}{22}\ \frac{}{20}\ \frac{}{21}\ \frac{}{15}\ \frac{}{6}\ \frac{}{17}\ \ \frac{}{6}\ \frac{}{15}\ \frac{}{2}\ \frac{}{25}$

Bulgaria? $\frac{}{24}\ \frac{}{17}\ \frac{}{16}\ \frac{}{15}\ \frac{}{11}$

Egypt? $\frac{}{6}\ \frac{}{11}\ \frac{}{15}\ \frac{}{4}\ \frac{}{17}$

Czechoslovakia? $\frac{}{5}\ \frac{}{4}\ \frac{}{11}\ \frac{}{8}\ \frac{}{26}\ \frac{}{20}$

Making Practice Fun 96 Name _____

Quadratic Equations—Solving Using the Quadratic Formula

INFORMATION TIME

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

Solve.

1. $x^2 - 2x - 5 = 0$ $1 \pm \sqrt{6}$
2. $x^2 - 3x - 3 = 0$
3. $x^2 - 4x = 6$
4. $x^2 + 5x = 3$
5. $x^2 + x = 1$
6. $x^2 + 2x = 1$
7. $x^2 + 3x = 5$
8. $2x^2 + 3x = 5$
9. $3x^2 + 2x = 7$
10. $5x^2 + x = 1$
11. $3x^2 + 7x + 2 = 1$
12. $6x^2 + 7x + 1 = 0$
13. $2x^2 + 8x + 3 = 0$
14. $5x^2 - 2x - 2 = 0$
15. $x^2 - x - 10 = 0$
16. $6x^2 = 0$
17. $3x^2 = 4$
18. $x^2 - 3x + 1 = 5$
19. $-2x^2 + 3x + 6 = 0$
20. $-x^2 - x + 3 = 0$
21. $x^2 - 4x - 13 = 0$
22. $5x^2 + 7x + 2 = 0$
23. $5x^2 - 3x = 2$
24. $x^2 - x - 4 = 0$
25. $3x^2 - 12x + 3 = 0$
26. $9x^2 + 6x - 10 = 0$
27. $3x^2 + 5x - 20 = 10 - x$
28. $x^2 - 3x - 9 = 18 - 3x$
29. $x^2 + 4x - 2 = 3 - 3x$
30. $x^2 + 5x + 2 = 3x + 9$

What is the math term for 10^{100}?

G $\pm\frac{2\sqrt{3}}{3}$	**O** $\frac{-7 \pm \sqrt{37}}{6}$	**L** $-1 \pm 2\sqrt{2}$	**G** $\frac{3 \pm \sqrt{57}}{4}$	**A** $2 \pm \sqrt{3}$	**L** $\frac{3 \pm \sqrt{57}}{2}$
B $\frac{-3 \pm \sqrt{29}}{2}$	**A** $-1, -\frac{1}{6}$	**L** $\frac{1 \pm \sqrt{17}}{2}$	**G** $\frac{-1 \pm \sqrt{11}}{3}$	**O** $\frac{-1 \pm \sqrt{41}}{2}$	**A** $-1, -\frac{2}{5}$
G $\frac{3 \pm \sqrt{21}}{2}$	**L** $4, -1$	**G** $\frac{-1 \pm \sqrt{22}}{3}$	**G** $\frac{-3 \pm \sqrt{21}}{2}$	**A** $\frac{1 \pm \sqrt{11}}{5}$	**G** $\frac{-4 \pm \sqrt{10}}{2}$
A $\pm 3\sqrt{3}$	**B** $\frac{-5 \pm \sqrt{37}}{2}$	**O** $-1, \frac{5}{2}$	**O** $1 \pm \sqrt{6}$	**H** $\frac{-1 \pm \sqrt{21}}{10}$	**A** $\frac{-7 \pm \sqrt{69}}{2}$
B $1, -\frac{2}{5}$	**O** $\pm\frac{\sqrt{3}}{3}$	**O** $2 \pm \sqrt{10}$	**H** $1, -\frac{5}{2}$	**O** $0, 0$	**L** $2 \pm \sqrt{17}$
G $\frac{1 \pm \sqrt{11}}{3}$	**G** $\frac{1 \pm \sqrt{41}}{2}$	**A** $-1 \pm \sqrt{2}$	**G** $\frac{-1 \pm \sqrt{13}}{2}$	**A** $\frac{-1 \pm \sqrt{5}}{2}$	**G** $-1 \pm \sqrt{11}$

Making Practice Fun 97 Name_____

Quadratic Equations—Solving Formulas

DOT-TO-DOT PUZZLE

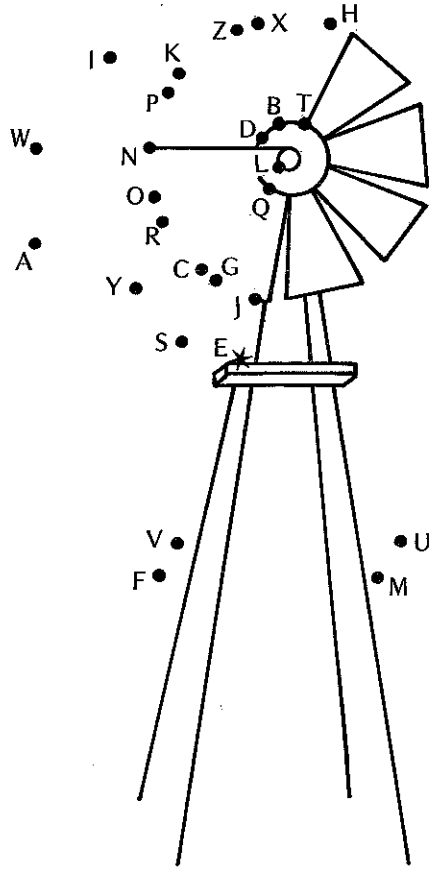
1. Work each exercise.
2. Find the dot letter for that answer.
3. Connect the dot letters in order.

Exercises

Solve for the indicated letter.

1. $T = 2\pi\sqrt{\frac{l}{g}}; l$ $\frac{gT^2}{4\pi^2}$ E
2. $T = 2\pi\sqrt{\frac{l}{g}}; g$
3. $F = \frac{mv^2}{r}; v$
4. $C = Ke^2; e$
5. $K = \frac{1}{2}mv^2; v$
6. $M = \frac{R^2}{E^2}; R$
7. $M = \frac{R^2}{E^2}; E$
8. $d = \frac{1}{2}at^2; t$
9. $A = s^2; s$
10. $V = \frac{\pi r^2 a}{3}; r$
11. $s = 4\pi r^2; r$
12. $h = 3\sqrt{2k}; k$
13. $A = c^2 + b^2; b$
14. $\frac{1}{e} = \sqrt{\frac{4A}{x} - w}; e$
15. $mT^2 = 3; T$
16. $h = \sqrt{c^2 - a^2}; a$
17. $A = 3\pi m^2 e + k; m$
18. $L = \frac{1}{A^2} + \frac{1}{B^2}; A$

Dot Letter	Answer	Dot Letter	Answer
A	$\pm\sqrt{\frac{2d}{a}}$	N	$\pm\sqrt{\frac{3V}{\pi a}}$
B	$\pm\sqrt{\frac{3}{m}}$	O	$\pm\sqrt{EM^2}$
C	$\pm\sqrt{\frac{2K}{m}}$	P	$\pm\sqrt{\frac{s}{4\pi}}$
D	$\frac{h^2}{18}$	Q	$\pm\sqrt{\frac{C}{K}}$
E	$\frac{gT^2}{4\pi^2}$	R	$\pm\sqrt{E^2M}$
F	$\pm\sqrt{\frac{3a}{\pi V}}$	S	$\pm\sqrt{\frac{2m}{F}}$
G	$\pm\sqrt{\frac{rF}{m}}$	T	$\pm\frac{B}{\sqrt{LB^2 - 1}}$
H	$\pm\sqrt{\frac{A - k}{3\pi e}}$	U	$\pm\sqrt{h^2 - c^2}$
I	$\pm\sqrt{\frac{s}{2\pi}}$	V	$\pm\sqrt{\frac{A + k}{3\pi e}}$
J	$\frac{4\pi^2 l}{T^2}$	W	$\pm\sqrt{A}$
K	$\pm\sqrt{A - c^2}$	X	$\pm\sqrt{c^2 - h^2}$
L	$\pm\sqrt{\frac{R^2}{M}}$	Y	$\frac{h^2}{9}$
M	$\pm\sqrt{A^2}$	Z	$\pm\sqrt{\frac{x}{4A - xw}}$



Name _____

Quadratic Equations—Solving Geometry Problems

DIAGRAM PUZZLE

1. Work Exercise A1 and Exercise B1.
2. Draw a straight line segment connecting these two answers.
3. Continue with Exercise A2 and Exercise B2, and so on.

Exercises A

1. A picture frame is 22 cm by 15 cm. If 198 cm^2 of picture shows, find the width of the frame. 2 cm

2. The length of a rectangle is 1 m greater than the width. The area of the rectangle is 110 m^2. Find the length of the rectangle.

3. Find the width of the rectangle in Exercise 3B.

4. The length of a rectangle is 5 times the width. The area is 80 m^2. Find its width.

5. The length of a rectangle is 8 times the width. The area is 72 cm^2. Find the length.

6. The perimeter of a rectangle is 30 cm. The area is 36 cm^2. Find the length of the rectangle.

7. The perimeter of a rectangle is 36 m. The area is 65 m^2. Find the length of the rectangle.

Exercises B

1. A picture frame is 18 cm by 14 cm. If 165 cm^2 of picture shows, find the width of the frame.

2. Find the width of the rectangle in Exercise 2A.

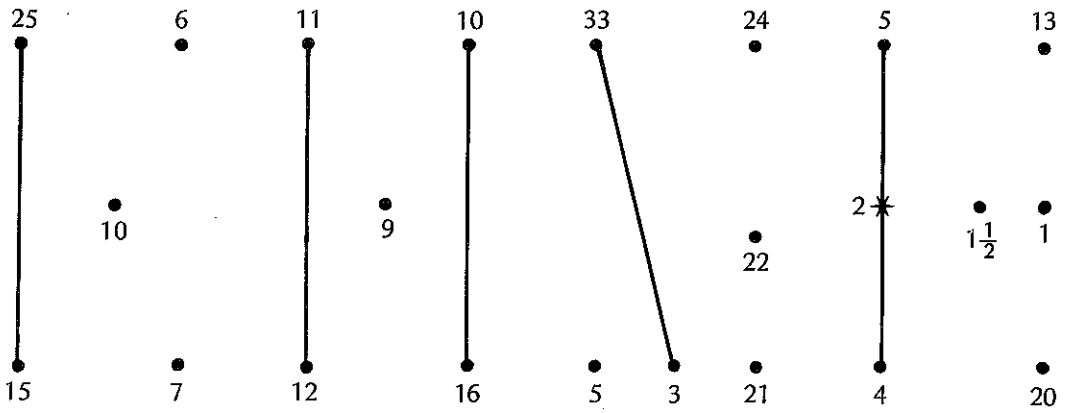
3. The length of a rectangle is 8 m greater than the width. The area is 105 m^2. Find the length of the rectangle.

4. Find the length of the rectangle in Exercise 4A.

5. Find the width of the rectangle in Exercise 5A.

6. The perimeter of a rectangle is 40 cm. The area is 64 cm^2. Find the length of the rectangle.

7. Find the width of the rectangle in Exercise 7A.



Making Practice Fun 99 Name _____

Quadratic Equations—Solving Interest Problems

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

What is the interest rate?

1. $1440 grows to $1690 in 2 years. 8.3%
2. $2250 grows to $2890 in 2 years.
3. $3610 grows to $4000 in 2 years.
4. $4900 grows to $6400 in 2 years.
5. $8100 grows to $10,000 in 2 years.
6. $3600 grows to $4900 in 2 years.
7. $4410 grows to $4840 in 2 years.
8. $3000 doubles itself in 2 years.
9. $1000 triples itself in 2 years.

WE 13.3%	LOSE 41.2%	SOME 11.1%	TIMES 41.4%
DON'T 14.5%	WE 16.6%	EVER 8.3%	WIN 14.3%
EARN 73.2%	HOW 4.8%	MUCH 5.3%	INTEREST 5.4%

Making Practice Fun 100 Name _____

Quadratic Equations—Solving Motion Problems

DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.
3. Draw the four segments necessary to form two similar familiar polygons.

Exercises

1. The current in a river moves at a speed of 2 km/h. A boat travels 30 km upriver and 30 km downriver in a total time of 8 hours. What is the speed of the boat in still water? 8 km/h

2. The current in a river moves at a speed of 4 km/h. A boat travels 32 km upriver and 32 km downriver in a total time of 6 hours. What is the speed of the boat in still water?

3. The current in a river moves at a speed of 3 km/h. A boat travels 24 km upriver and 24 km downriver in a total time of 6 hours. What is the speed of the boat in still water?

4. The current in a river moves at a speed of 4 km/h. A boat travels 48 km upriver and 24 km downriver in a total time of 4 hours. What is the speed of the boat in still water?

5. A boat travels at a speed of 15 km/h in still water. It travels 10 km upriver and 40 km downriver in a total time of 3 hours. What is the speed of the current?

6. A boat travels at a speed of 24 km/h in still water. It travels 36 km upriver and 60 km downriver in a total time of 4 hours. What is the speed of the current?

7. An airplane flies 720 km against the wind and 1080 km with the wind in a total time of 12 hours. If the plane's speed in still air is 150 km/h, what is the speed of the wind?

8. An airplane flies 760 km against the wind and 780 km with the wind in 7 hours. If the plane's speed in still air is 225 km/h, what is the speed of the wind?

Making Practice Fun 101 Name_____

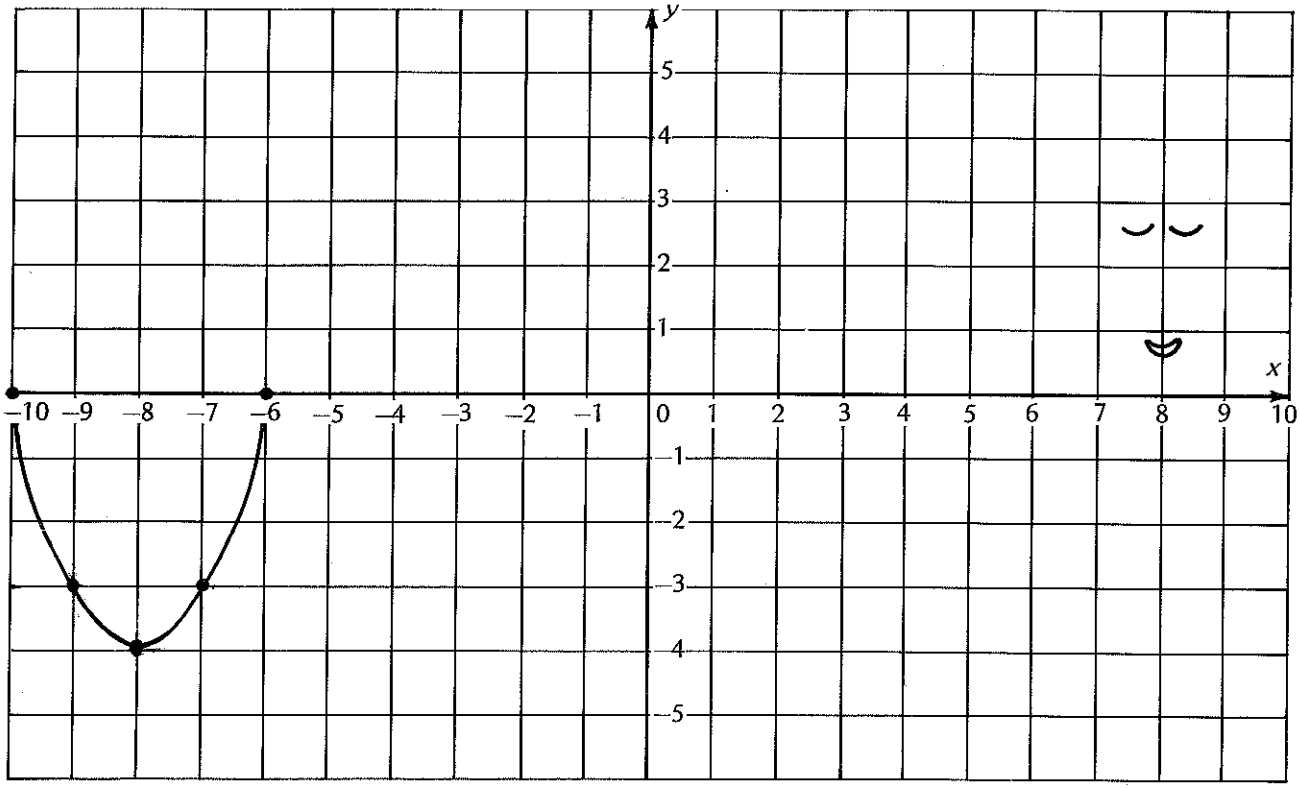
Quadratic Equations—Graphing

PICTO-GRAPH

1. Graph each quadratic equation on the coordinate axes below.
2. Show only the part of the graph that is 4 units above or below the vertex.

Exercises

1. $y = x^2 + 16x + 60$
2. $y = -x^2 - 4x - 3$
3. $y = x^2 - 4$
4. $y = x^2 - 8x + 12$
5. $y = -x^2 - 12x - 35$
6. $y = -x^2 + 4x - 3$
7. $y = x^2 + 8x + 12$
8. $y = -x^2 + 16x - 60$



Making Practice Fun 102 Name_____

Sets, Functions, and Relations—Closure, Subsets

HIDDEN MESSAGE

1. Use the sets below to determine whether or not the statement in each block is true.
2. Shade the true statements.
3. Read the message in the unshaded blocks.

$X = \{1, 3, 5, 7\}$
$Y = \{0, 1, 2\}$
$W = \{b, c\}$

$K = \{c, e\}$
$M = \{0, 1\}$
$P = \{1\}$

$Q = \{2, 3, 4, 5, 6, 7\}$
$R = \{2, 4, 6\}$
$T = \{a, b, c, d\}$

S $\{1, 3\} \subset X$	**E** $M \subset Y$	**T** $5 \in R$	**S** $P \subset M$	**Y** $M \subset X$	**O** $b \in W$	**U** $W \subset T$	**R** $a \in T$
B P is closed under multiplication	**E** Y is closed under multiplication	**S** P is closed under division	**D** M is closed under addition	**T** $c \in W$	**T** $b \in K$	**R** $R \subset Q$	**Y** $P \subset X$
G $M \subset P$	**R** $0 \in M$	**A** $Q \subset R$	**N** $P \subset Y$	**E** P is closed under subtraction	**D** $d \in T$	**T** $K \subset T$	**S** $c \in T$
L $2 \in Y$	**E** $Y \subset W$	**T** $c \in K$	**G** $3 \in Y$	**S** $3 \in X$	**E** $1 \in Q$	**O** $1 \in Y$	**O** $Y \subset Q$
R $W \subset K$	**E** $6 \in R$	**A** $6 \in Q$	**L** $7 \in X$	**S** $6 \in X$	**E** $2 \in Y$	**G** $2 \in P$	**T** $5 \in X$

Making Practice Fun 103 Name_____

Sets, Functions and Relations—Finding Solution Sets of Sentences

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

Find the solution set. Use $\{-6, -5, -4, -3, -2, -1, 0, 1, 2, 3\}$ as the replacement set.

1. $|2x - 1| = 3$ $\{-1, 2\}$
2. $|3x + 1| = 7$
3. $|y| > 2$
4. $|y| > 4$
5. $|x| = 1$
6. $|x + 2| > 3$
7. $|x + 2| < 3$
8. $|x - 4| < 2$
9. $|x - 3| > 2$
10. $|y| > 1$
11. $|y| > 3$
12. $|m| = -3$
13. $|m| = 3$
14. $|t| = 4$
15. $x^2 + 2x - 8 = 0$
16. $x^2 + 2x - 24 = 0$
17. $x^2 + x = 0$
18. $x^2 - 6x = 0$
19. $\frac{30}{|x|} = 15$
20. $\frac{35}{|x|} = 7$
21. $\frac{6}{|x - 3|} = 1$
22. $\frac{16}{|x + 15|} = 1$

What did the sapling say when it grew up?

W $\{1, -1\}$	**O** $\{3, -3\}$	**R** $\{0\}$	**H** $\{3\}$	**K** $\{2\}$
G $\{1, 2\}$	**R** $\{-6, -5, -4, -3, 3\}$	**A** $\{2, -2\}$	**D** $\emptyset$	**T** $\{3, 4, 5\}$
E $\{-4, 2\}$	**T** $\{-6, -5, -4, -3, -2, -1, 0\}$	**M** $\{-6, 6\}$	**O** $\{-5\}$	**T** $\{1\}$
E $\{-6, -5, -4, -3\}$	**G** $\{-6, 2, 3\}$	**G** $\{-4\}$	**L** $\{-1, 2\}$	**R** $\{0, 1, -1\}$
S $\{-6, -5, -4\}$	**E** $\{-3\}$	**E** $\{-2\}$	**N** $\{-6, -5, -4, -3, -2, 2, 3\}$	**S** $\{0, -1\}$
O $\{-2, -1, 3\}$	**M** $\{-5, -6\}$	**I** $\{-6\}$	**A** $\{-4, -3, -2, -1, 0\}$	**Y** $\{-2, -3\}$

Making Practice Fun 104 Name_____

Sets, Functions, and Relations--Intersections and Unions of Sets

FACTS ABOUT MYTHOLOGY

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Use the sets below to find each union or intersection.

$F = \{0, 1, 2, 3\}$ $J = \{1, 3, 5, 7\}$ $Q = \{2, 4, 6, 8, 10\}$
$G = \{2, 3\}$ $K = \{0, 4, 6, 8\}$ $W = \{2, 3, 4\}$
$X = \{4, 5\}$ $Y = \{0, 5, 7, 8\}$

1. $F \cap J = \{1, 3\}$ I
2. $G \cup W$
3. $K \cap F$
4. $W \cap Q$
5. $X \cup F$
6. $K \cap Q$
7. $X \cap W$
8. $X \cup G$
9. $G \cap J$
10. $K \cap Y$
11. $W \cap Y$
12. $J \cup G$
13. $X \cup Y$
14. $Q \cap Y$
15. $J \cap X$
16. $G \cap W$
17. $K \cup X$
18. $Q \cap F$

Code Letter	Answer
A	$\{0, 4, 5, 7, 8\}$
B	$\{1, 2, 3, 5, 7\}$
C	$\{4\}$
D	$\{5\}$
E	$\{8\}$
H	$\{0, 1, 2, 3, 4, 5\}$
I	$\{1, 3\}$
L	$\{2, 3\}$
M	$\{3\}$
N	$\{2, 3, 4\}$
O	$\{0, 4, 5, 6, 8\}$
P	$\{2, 4\}$
R	$\{4, 6, 8\}$
S	$\emptyset$
T	$\{0, 8\}$
U	$\{0\}$
V	$\{2, 3, 4, 5\}$
W	$\{2\}$

In mythology, who was . . .

Jupiter's father? ___ ___ ___ ___ ___ ___
11 13 10 3 6 2

the smith? ___ ___ ___ ___ ___ ___
8 3 16 7 13 2

the god of music? ___ ___ ___ ___ ___ ___
13 4 17 16 16 17

Jupiter's weapon? ___ ___ ___ ___ ___ ___ ___
10 5 3 2 15 14 6

the goddess of the rainbow? I ___ ___ I ___
1 6 1 11

the god of war? ___ ___ ___ ___
9 13 6 11

the goddess of the moon? ___ I ___ ___ ___
15 1 13 2 13

Cupid's Greek name? ___ ___ ___ ___
14 6 17 11

the god of wine? ___ ___ ___ ___ ___ ___ ___
12 13 7 7 5 3 11

the goddess of wisdom? ___ ___ ___ ___ ___ ___
13 10 5 14 2 14

Minerva's favorite bird? ___ ___ ___
17 18 16

 Name_____

Sets, Functions and Relations—Conjunctions, Disjunctions

HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Find the answer to the question in the unshaded blocks.

Exercises

Find the solution set. Use $\{-10, -9, -8, -7, -6, -5, -4, -3, -2, -1, 0, 1, 2\}$ as the replacement set.

1. $x < -5 \vee x > 1$ $\{-10, -9, -8, -7, -6, 2\}$
2. $x > 0 \wedge x < 2$
3. $x > -8 \wedge x < -5$
4. $x > -2 \vee x + 5 = -5$
5. $x < -8 \vee x + 6 = 7$
6. $x \leqslant -7 \vee x - 2 = 0$
7. $|x| = 4 \vee |x| = 1$
8. $x > 0 \vee x - 6 < -14$
9. $x + 2 > 3 \wedge x - 4 > -5$
10. $x + 8 < 4 \wedge |x| = 7$
11. $x > -3 \vee x < -9$
12. $x > -7 \wedge x < -4$
13. $|x| > 2 \wedge x > -4$
14. $|x| < 2 \wedge x < 1$
15. $|x| > 1 \wedge x < -8$
16. $|x| = 0 \vee x < -6$
17. $x + 8 = 0 \vee x - 1 = 0$
18. $x > -10 \wedge x < -5$
19. $|x| \leqslant 1 \wedge x \geqslant 0$

There is a delicious unit of weight used in Bombay. What is it?

P $\{-3\}$	**I** $\{-8, 1\}$	**E** $\{-10, -9, -8, -7, 2\}$	**F** $\{-10, -1, 0, 1, 2\}$
I $\{1\}$	**C** $\{0, 1\}$	**E** $\{-7\}$	**U** $\{-10, -9, -8, -7, 0\}$
C $\{-8, -7, 1\}$	**A** $\{1, 2\}$	**O** $\{-10, -9, -8, -7, -6, 2\}$	**D** $\{-4, -1, 1\}$
E $\{-10, -9, 1\}$	**N** $\{3\}$	**D** $\{-1, 0, 1\}$	**G** $\{-1, 0\}$
P $\{2\}$	**I** $\{-7, -6\}$	**C** $\{-10, -2, -1, 0, 1, 2\}$	**Y** $\{-10, -9, -8\}$
D $\{-6, -5\}$	**L** $\{-9, -10\}$	**A** $\{-9, -8, -7, -6\}$	**E** $\{-10, -9, 1, 2\}$

Making Practice Fun 106 Name_____

Sets, Functions, and Relations—Finding Values of Functions

DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

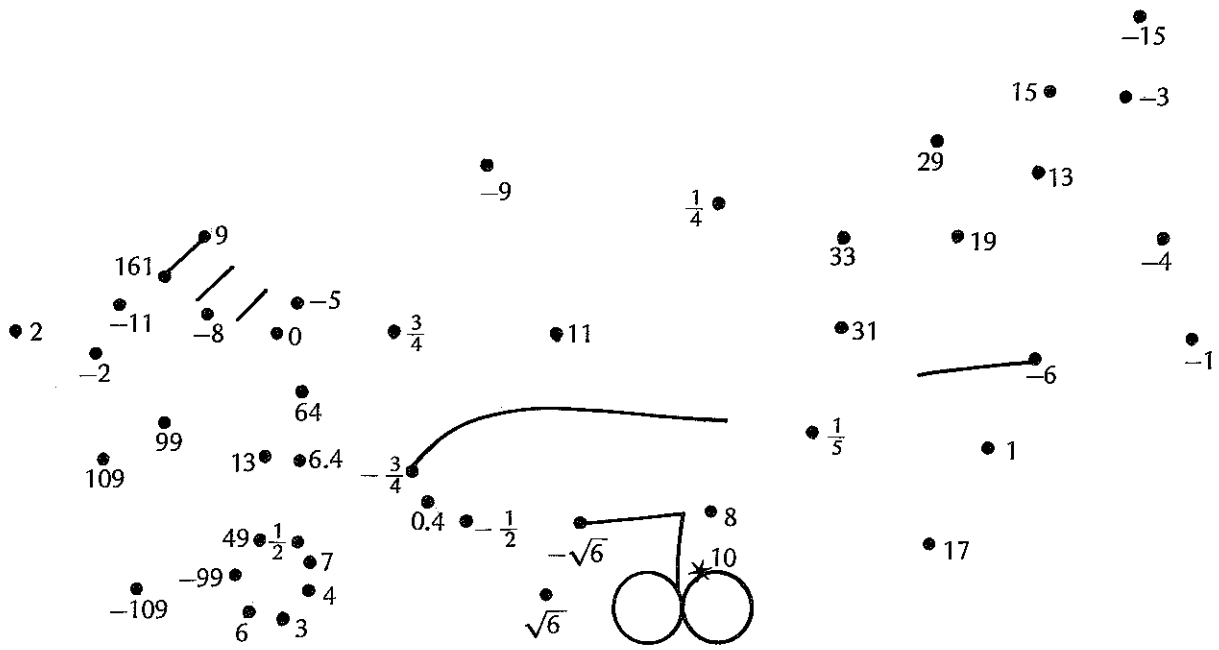
Exercises

Use the functions below to work each exercise.

$f(x) = x + 6$ $g(x) = x^2 - 1$ $h(x) = 3x + 4$

$k(x) = 2x^2 - 4x + 1$ $p(x) = -x$

1. $f(4) = 10$
2. $g(3)$
3. $h(-1)$
4. $k(1)$
5. $p(6)$
6. $f(-9)$
7. $g(-4)$
8. $h(5)$
9. $k(-3)$
10. $p(-9)$
11. $f(-11)$
12. $g(1)$
13. $h(-4)$
14. $k(10)$
15. $p(11)$
16. $f(-8)$
17. $g(-10)$
18. $h(3)$
19. $k(6)$
20. $p(99)$
21. $f(0)$
22. $g(2)$
23. $h(0)$
24. $k(3)$
25. $p(-\frac{1}{2})$
26. $f(0.4)$
27. $g(\frac{1}{2})$
28. $h(-1.2)$
29. $k(\frac{1}{2})$
30. $p(\sqrt{6})$



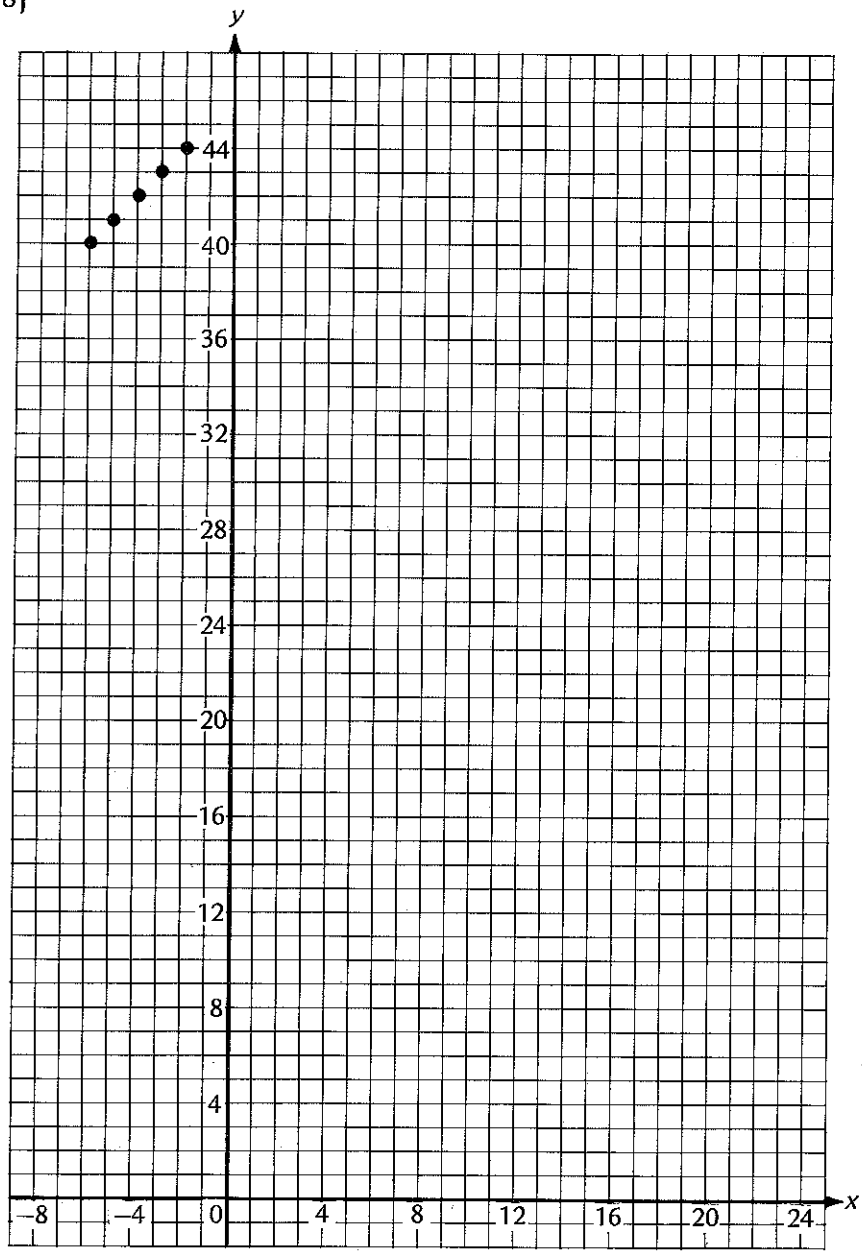
Sets, Functions, and Relations—Graphing Functions for Given Values of the Domain

DIAGRAM PUZZLE

1. Graph the function given in each exercise. The domain of each is the set given.
2. Connect the dots to form the word "peace."

Exercises

1. $y = x + 46$ $\{-6, -5, -4, -3, -2\}$
2. $y = x + 16$ $\{9, 10, 11, 12, 13\}$
3. $y = x + 6$ $\{14, 15, 16, 17, 18\}$
4. $y = -x + 38$ $\{6, 7, 8\}$
5. $y = -x + 42$ $\{3, 4, 5\}$
6. $y = x + 42$ $\{-1, 0\}$
7. $y = -x + 38$ $\{16, 17\}$
8. $y = -x + 34$ $\{-1, 0, 1\}$
9. $y = -x + 42$ $\{8, 9, 10\}$
10. $y = -x + 34$ $\{14, 15, 16\}$
11. $y = -x + 40$ $\{-3, -2, -1\}$
12. $y = x + 22$ $\{6, 7, 8, 9, 10\}$
13. $y = -x + 42$ $\{13, 14, 15\}$
14. $y = -x + 38$ $\{1, 2\}$
15. $y = -x + 34$ $\{9, 10, 11\}$
16. $y = -x + 42$ $\{18, 19, 20\}$
17. $y = -x + 42$ $\{-2, -1, 0\}$
18. $y = x + 36$ $\{-1, 0, 1, 2, 3\}$
19. $y = x + 26$ $\{4, 5, 6, 7, 8\}$



 Name_____

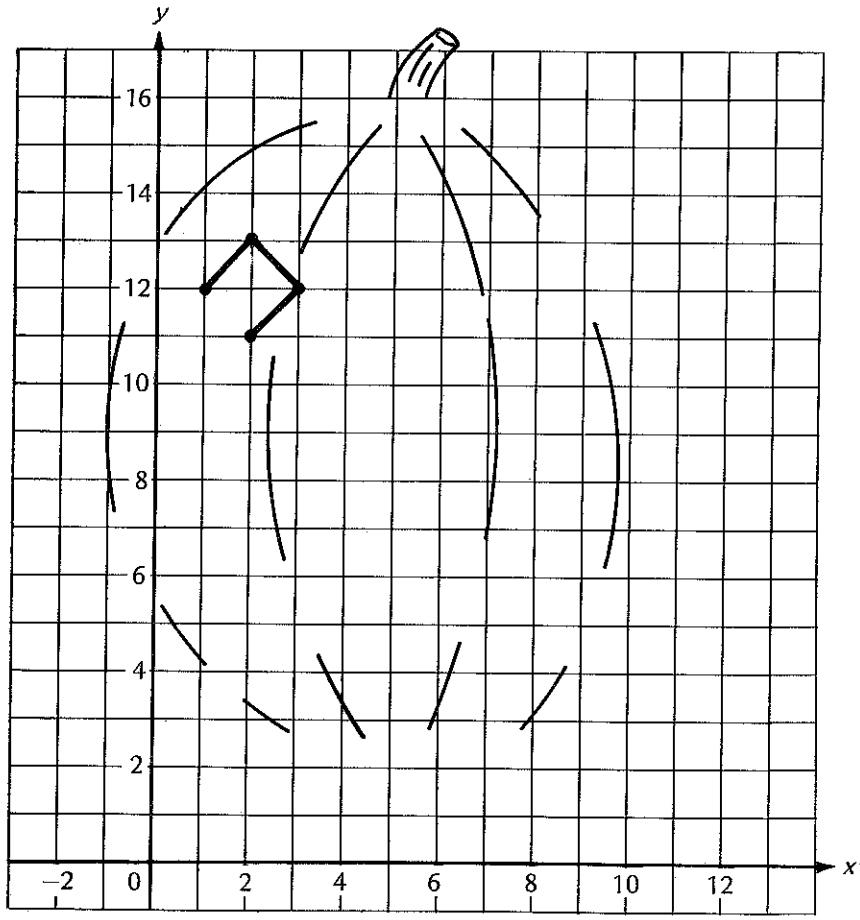
Sets, Functions, and Relations—Graphing Relations

PICTO-GRAPH

1. Graph each relation.
2. Connect the points in each relation in order.
3. If the relation is *not* a function, use *heavy lines*, otherwise, use light lines.

Exercises

1. $A = \{(1, 12), (2, 13), (3, 12), (2, 11)\}$ Not a function
2. $B = \{(7, 16), (4, 16), (1, 15), (-1, 13), (-2, 10)\}$
3. $C = \{(5, 10), (4, 9), (6, 9)\}$
4. $D = \{(4, 2), (8, 2\frac{1}{2}), (11, 5), (12, 8)\}$
5. $E = \{(7, 12), (8, 13), (9, 12), (8, 11)\}$
6. $F = \{(1, 5), (2, 6), (8, 6), (9, 5), (8, 5)\}$
7. $G = \{(7, 16), (10, 14), (11\frac{1}{2}, 12), (12, 8)\}$
8. $H = \{(-2, 10), (-1\frac{1}{2}, 7), (0, 4), (4, 2)\}$
9. $I = \{(2, 11), (1, 12), (2, 13)\}$
10. $J = \{(8, 11), (7, 12), (8, 13)\}$
11. $K = \{(5, 10), (6, 9), (5, 9)\}$
12. $L = \{(8, 5), (1, 5), (2, 6), (8, 6)\}$



Making Practice Fun 109 Name_____

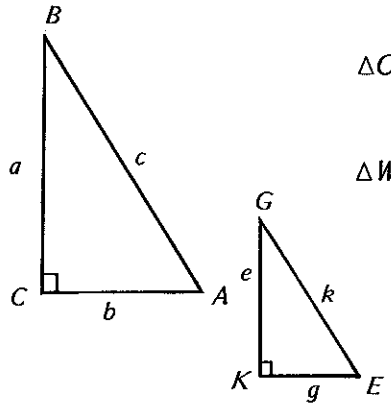
Right Triangle Trigonometry—Writing Proportions, Finding Missing Sides

DOT-TO-DOT PUZZLE

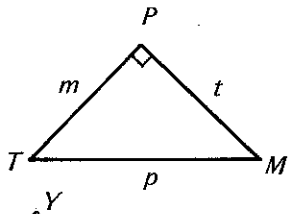
1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

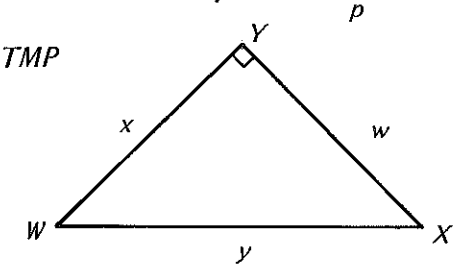
Use the triangles below.



$\triangle CAB \sim \triangle KEG$

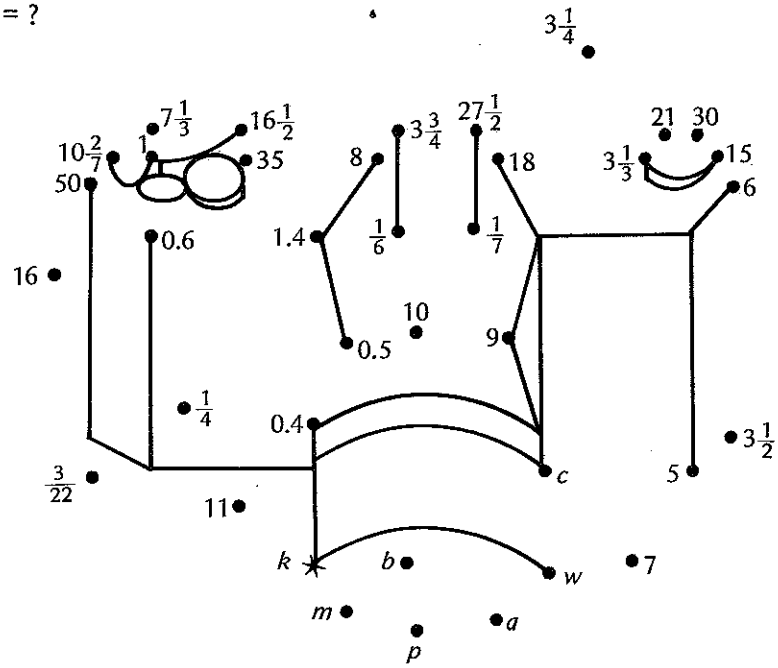


$\triangle WXY \sim \triangle TMP$



1. $\frac{a}{e} = \frac{c}{?}$ k
2. $\frac{w}{t} = \frac{x}{?}$
3. $\frac{x}{y} = \frac{m}{?}$
4. $\frac{?}{b} = \frac{e}{g}$
5. $\frac{?}{y} = \frac{t}{p}$
6. $\frac{b}{?} = \frac{g}{k}$

7. If $a = 8, c = 10, e = 4$, then $k = ?$
8. If $x = 12, w = 14, m = 3$, then $t = ?$
9. If $y = 15, p = 10, x = 9$, then $m = ?$
10. If $b = 24, a = 40, g = 9$, then $e = ?$
11. If $c = 36, k = 30, g = 25$, then $b = ?$
12. If $x = 28, w = 24, t = 18$, then $m = ?$
13. If $y = 6, p = 5, w = 4$, then $t = ?$
14. If $a = 27, c = 42, k = 28$, then $e = ?$
15. If $p = 18, m = 11, y = 45$, then $x = ?$
16. If $a = 9, g = 5, b = 12$, then $e = ?$
17. If $a = 14, b = 14, e = 8$, then $g = ?$
18. If $m = 4, t = 10, x = 14$, then $w = ?$
19. If $x = 33, w = 22, t = 11$, then $m = ?$
20. If $x = 33, w = 22, m = 11$, then $t = ?$
21. If $p = 10, y = 100, x = 10$, then $m = ?$
22. If $t = 7, m = 8, w = 9$, then $x = ?$
23. If $a = 250, c = 350, k = 70$, then $e = ?$
24. If $b = 2.4, g = 0.4, a = 3.6$, then $e = ?$
25. If $x = 3.4, w = 1.7, m = 2.8$, then $t = ?$
26. If $w = 0.09, y = 0.9, t = 0.04$, then $p = ?$
27. If $x = 1.7, y = 5.1, p = 1.5$, then $m = ?$
28. If $x = \frac{1}{2}, m = \frac{1}{4}, w = \frac{1}{3}$, then $t = ?$
29. If $a = \frac{3}{5}, b = \frac{1}{5}, e = \frac{3}{7}$, then $g = ?$
30. If $c = 19, k = 1.9, g = 0.9$, then $b = ?$



Making Practice Fun 110 Name_____

Right Triangle Trigonometry—Finding the Sine

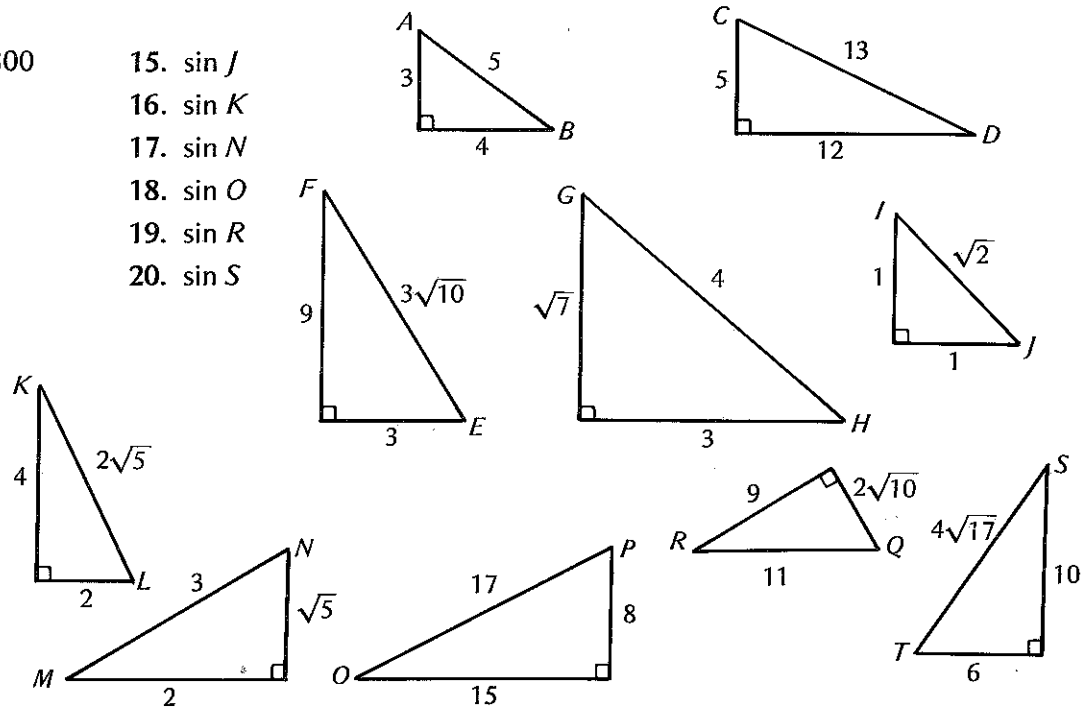
HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises.

Use the triangles at the right. Find the sine in reduced radical form or rounded to three decimal places.

1. sin $A = 0.800$
2. sin C
3. sin E
4. sin H
5. sin I
6. sin L
7. sin M
8. sin P
9. sin Q
10. sin T
11. sin B
12. sin D
13. sin F
14. sin G
15. sin J
16. sin K
17. sin N
18. sin O
19. sin R
20. sin S



O 0.474	**N** $\frac{5\sqrt{17}}{34}$	**E** $\frac{3\sqrt{10}}{10}$	**A** 0.471	**S** $\frac{2\sqrt{5}}{5}$	**K** $\sqrt{10}$
A $\frac{\sqrt{5}}{3}$	**N** $\frac{\sqrt{2}}{2}$	**S** 0.800	**W** 0.667	**E** $\frac{\sqrt{7}}{4}$	**R** 0.923
F $\frac{\sqrt{10}}{10}$	**I** 0.818	**N** 0.882	**D** 0.75	**M** $\frac{3\sqrt{17}}{34}$	**E** $\frac{2\sqrt{10}}{11}$
A $\frac{3\sqrt{17}}{14}$	**N** $\frac{\sqrt{5}}{5}$	**D** 0.600	**T** $\frac{\sqrt{2}}{2}$	**R** 0.385	**Y** 0.925

Making Practice Fun 111 Name _____

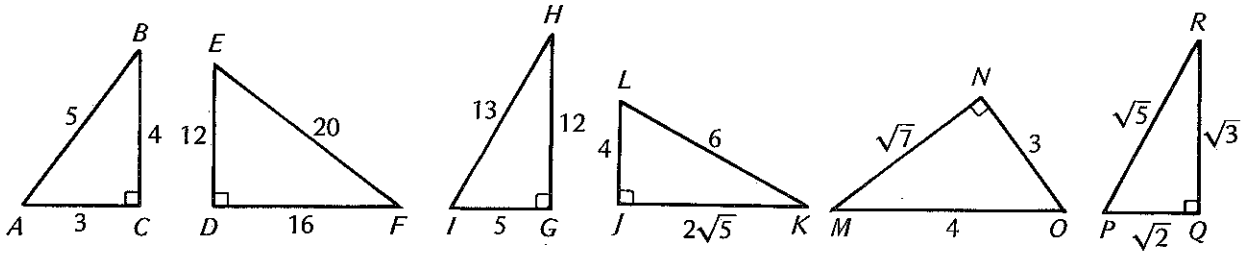
Right Triangle Trigonometry—Finding the Cosine and the Tangent

FACTS ABOUT MONEY

1. Work each exercise.
2. Find the code letter for the correct answer.
3. Write the code letter in each blank having that exercise number.

Exercises

Use the triangles below. Find the cosine or tangent in reduced radical form or rounded to three decimal places.



1. cos $A = 0.600$ **D**
2. tan B
3. cos F
4. cos R
5. cos I
6. tan H
7. cos K
8. tan L
9. cos M
10. tan O
11. cos H
12. tan I
13. cos L
14. tan K
15. tan M
16. cos P
17. tan P
18. tan E
19. tan A

Code Letter	Answer	Code Letter	Answer
A	$\frac{2\sqrt{5}}{5}$	N	$\frac{\sqrt{5}}{3}$
B	$\frac{\sqrt{5}}{5}$	O	0.750
C	$\frac{3\sqrt{7}}{7}$	P	0.800
D	0.600	Q	0.745
E	$\frac{\sqrt{7}}{4}$	R	$\frac{\sqrt{7}}{3}$
F	0.667	S	2.4
G	1.333	T	$\frac{\sqrt{6}}{2}$
H	2.2	U	$\frac{\sqrt{15}}{5}$
I	0.416	V	$\frac{\sqrt{7}}{2}$
J	$\frac{\sqrt{6}}{3}$	W	$\frac{\sqrt{5}}{10}$
K	$\frac{\sqrt{5}}{2}$	X	0.426
L	0.923	Y	0.385
M	$\frac{7\sqrt{7}}{3}$	Z	$\frac{\sqrt{10}}{5}$

What is the unit of currency in . . .

Norway? ___ ___ ___ ___ ___
8 10 2 7 9

Malaysia? ___ ___ ___ ___ ___ ___ ___
10 6 7 18 19 6 17

Poland? ___ ___ ___ ___ ___
16 11 2 17 5

Switzerland? ___ ___ ___ ___ ___
13 10 14 7 15

Laos? ___ ___ ___
8 6 3

India? ___ ___ ___ ___ ___
10 4 3 9 9

Portugal? ___ ___ ___ ___ D ___ ___
9 12 15 4 1 2

Making Practice Fun 112 Name_____

Right Triangle Trigonometry—Finding Values of Trigonometric Functions Using Tables

DOT-TO-DOT PUZZLE

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

Exercises

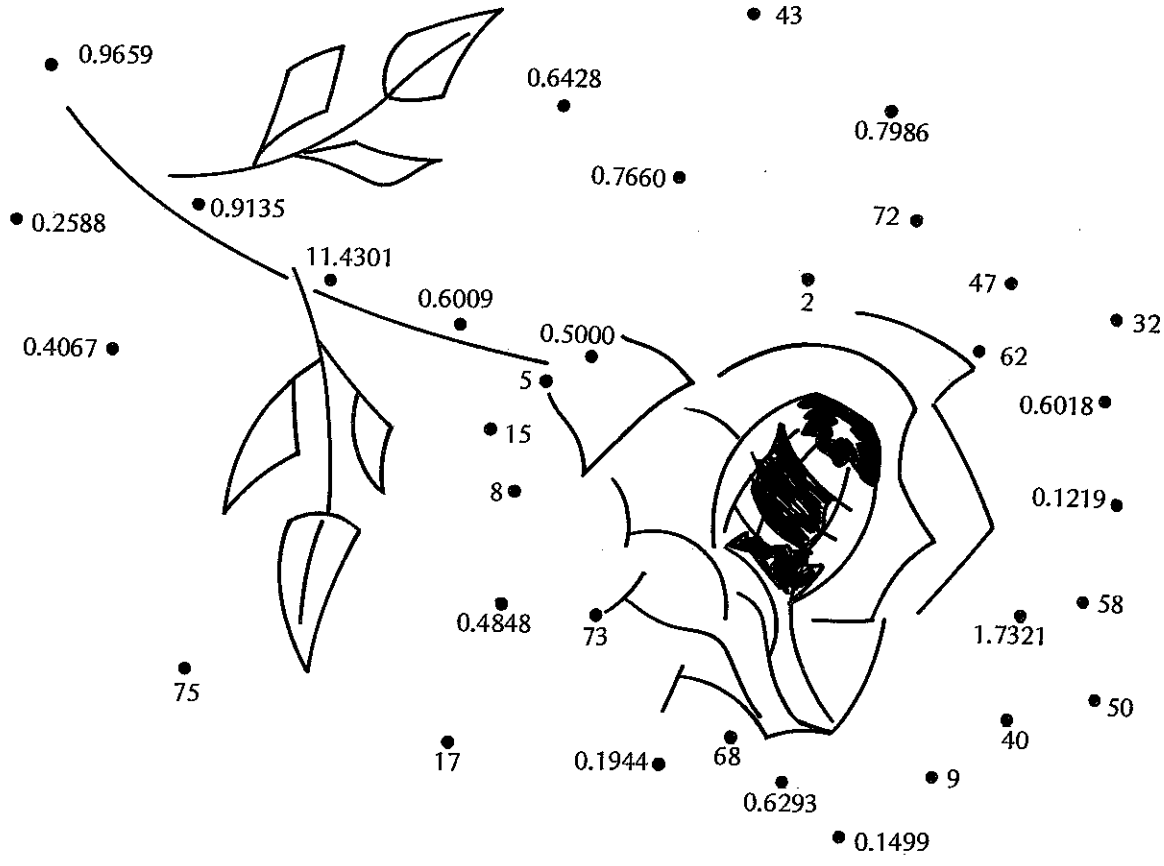
Find the value of each trigonometric function.

1. sin 10° = 0.1736
2. sin 75°
3. cos 24°
4. tan 85°
5. tan 31°
6. cos 60°
7. sin 50°

Find the value of x.

8. sin x = 0.0349
9. cos x = 0.3090
10. tan x = 1.0724
11. tan x = 1.8807
12. sin 37° = x
13. cos 83° = x
14. cos x = 0.5299
15. tan 60° = x
16. sin x = 0.6428
17. tan x = 0.1584
18. cos 51° = x
19. cos x = 0.3746
20. tan 11° = x
21. sin x = 0.9563
22. sin 29° = x
23. tan x = 0.1405
24. tan x = 0.2679
25. cos x = 0.9962

✶ 0.1736



Making Practice Fun 113 Name_____

Right Triangle Trigonometry—Solving Triangle Problems

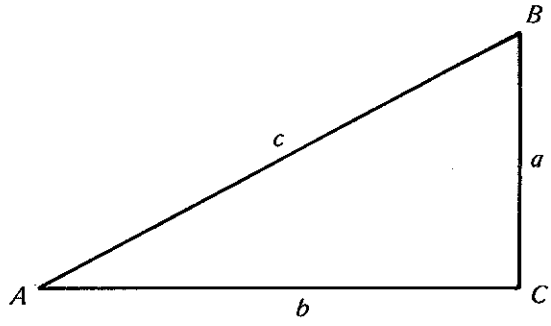
HIDDEN MESSAGE

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

Find angles to the nearest degree. Find sides to the nearest tenth.

1. $\angle A = 40°, b = 10, a = ?$ 8.4
2. $\angle B = 60°, c = 15, b = ?$
3. $b = 4.908, c = 5, \angle A = ?$
4. $a = 1.710, c = 5, \angle B = ?$
5. $a = 1.4, b = 2, \angle A = ?$
6. $\angle A = 34°, c = 100, b = ?$
7. $\angle B = 53°, c = 10, a = ?$
8. $\angle A = 25°, c = 12, a = ?$
9. $\angle B = 45°, a = 16, b = ?$
10. $a = 3, c = 5, \angle A = ?$
11. $a = 4, b = 9, \angle A = ?$
12. $\angle B = 70°, b = 93.9, c = ?$
13. $\angle B = 51°, b = 8, c = ?$
14. $\angle A = 14°, a = 11, c = ?$
15. $a = 40, b = 40, \angle A = ?$
16. $b = 16.18, c = 20, \angle A = ?$



D 66°	**O** 45°	**T** 8.4	**H** 5.1	**E** 11°
H 100.0	**O** 10	**U** 16.0	**R** 83°	**E** 37°
I 70°	**T** 45.5	**N** 5.2	**O** 36°	**W** 13
N 35°	**I** 10.3	**C** 6.0	**E** 79°	**R** 24°

SOLUTIONS

1. ACROSS: 1. 7842; 3. 429; 5. 888; 6. 1473; 7. 56 139; 10. 47; 11. 3246; 13. 3671; 15. 864; 17. 93; 20. 1784; 22. 147; 23. 116; 24. 507; 25. 2552; 26. 586; 29. 15; 31. 151 834; 34. 584; 36. 7464; 38. 7079; 40. 3440; 41. 56 665

DOWN: 1. 745; 2. 471; 3. 474; 4. 2373; 5. 8421; 6. 19; 8. 648; 9. 394; 11. 373; 12. 8710; 14. 6942; 16. 6465; 18. 842; 19. 1111; 21. 77; 22. 1575; 24. 5654; 27. 8160; 28. 930; 30. 574; 32. 879; 33. 475; 35. 475; 37. 44; 39. 96

2. The letters for each exercise are as follows.

1. T	18. A	30. S	44. T
2. A		31. H	45. H
3. K	19. F	32. E	46. E
4. E	20. R	33. E	
	21. I	34. T	47. F
5. A	22. E		48. A
	23. N	35. A	49. I
6. S	24. D		50. L
7. O		36. D	51. U
8. U	25. A	37. A	52. R
9. N		38. Y	53. E
10. D	26. W		54. S
	27. O	39. K	
11. T	28. R	40. E	55. A
12. I	29. K	41. E	56. W
13. P		42. P	57. A
		43. S	58. Y
14. F			
15. R			
16. O			
17. M			

3.

1. T	6. E	11. H
2. S	7. N	12. R
3. F	8. D	13. I
4. A	9. K	14. P
5. C	10. W	15. L

Knock, knock! Who's there? Anita. Anita Who? Anita lot of help!

4. Answer: Lettuce Alone (Let us alone)
The exercises needed for each letter are as follows.

L -	11	A -	9, 12
E -	6, 13	L -	4
T -	3, 16	O -	14, 17
T -	5, 19	N -	8
U -	1	E -	2, 10
C -	15		
E -	7, 18		

5.

1. 186	8. 200	15. 153 364
2. 1342	9. 32 000	16. 111 111
3. 230	10. 1235	17. 66 000
4. 1700	11. 100	18. 160
5. 8000	12. 8900	19. 32 600
6. 94	13. 50	20. 444 440
7. 7900	14. 240	

6.

1. 33	10. 55	19. 237	28. 42
2. 145	11. 144	20. 88	29. 14
3. 64	12. 91	21. 50	30. 76
4. 225	13. 30	22. 72	31. 140
5. 108	14. 36	23. 20	32. 119
6. 56	15. 12	24. 120	33. 54
7. 117	16. 6	25. 60	34. 52
8. 208	17. 52	26. 220	35. 21
9. 104	18. 1300	27. 5600	

The drawing shows the Liberty bell.

7. Exercises match the blocks as follows.

C	1	18	14	6	40	3	37
21	L	27	12	36	23	28	20
13	9	E	7	19	2	8	17
4	30	16	V	24	15	38	25
41	26	31	22	E	10	42	35
32	11	33	5	29	R	39	34

Clever

8.

1. W	12. C	25. W	37. H
2. H	13. A	26. H	38. A
3. E	14. R	27. E	39. V
4. N		28. N	40. E
	15. L		
5. I	16. I	29. T	41. A
6. S	17. K	30. H	
	18. E	31. E	42. R
7. A		32. Y	43. A
8. N	19. A		44. T
		33. B	45. T
9. O	20. S	34. O	46. L
10. L	21. N	35. T	47. E
11. D	22. A	36. H	
	23. K		
	24. E		
	?		

9.

Row 1	–	A
Row 2	–	SIGN (use second N)
Row 3	–	none
Row 4	–	OF
Row 5	–	none
Row 6	–	GENIUS
Row 7	–	none

10. The letters for each exercise are as follows.

1. A	8. E	15. T	22. H
2. K	9. S	16. U	23. E
3. V	10. B	17. H	24. O
4. W	11. Y	18. M	25. M
5. P	12. D	19. I	26. L
6. L	13. O	20. I	27. T
7. N	14. R	21. R	28. Y

Answers:
Kent. Kent Who? Kent you see I'm busy?
Stan. Stan Who? Stan by while I solve these problems.
Phil. Phil Who? Phil your heart with love and your mind with math!

11. Connect 31.23 to 11.25 to 7.8 to 4.6 to 31.23.
Connect 17 to 16 to 36 to 13 to 17.
Connect 48 to 19 to 2 to 6 to 48.
Connect 1-1/5 to 11/16 to 7/8 to 5/6 to 1-1/5.
Connect 21 to 7 to 174 to 35 to 21.

12.

1. 25	5. 523	9. 10	13. 42.75
2. 272	6. 70	10. 20	14. 330
3. 112	7. 74	11. 18	
4. 16	8. 781	12. 9	

Answer: LOVE (15, 42.25, 320, and 24)

13.

1. 7.9	13. 0.8	25. 5/11
2. 16.7	14. 6	26. 3/10
3. 11/15	15. 1	27. 80
4. 7/24	16. 11/14	28. 0.1
5. 290 344	17. 0.69	29. 0.3
6. 2104	18. 13.6	30. 0.31
7. 44.45	19. 139	31. 87.1
8. ¼	20. 17.6	32. 3.2
9. 123 012	21. 0.002048	33. 21
10. 1.2	22. 120	34. 5
11. 1-1/17	23. 37/40	35. 24
12. 206	24. 30	

The drawing shows a teddy bear.

14.

1. T	12. C	22. L	29. L
2. H	13. R	23. E	30. I
3. E	14. U	24. T	31. T
	15. S		32. T
4. G	16. H	25. O	33. L
5. R	17. E	26. U	34. E
6. A	18. D	27. T	
7. P			35. W
8. E	19. A	28. A	36. I
	20. N		37. N
9. W	21. D		38. E
10. A			
11. S			

15.

1. 8	17. –12	33. 109
2. –13	18. –8	34. –80
3. 0	19. 19	35. –90
4. 57	20. –5	36. –32
5. –102	21. 74	37. –88
6. 1	22. –74	38. 92
7. –1	23. –11	39. –875
8. 18	24. –28	40. –13
9. –200	25. 2	41. –14
10. 5	26. 20	42. 65
11. –19	27. –9	43. 6
12. 16	28. –15	44. –71
13. 41	29. –57	45. –28
14. 67	30. 56	46. 810
15. –1000	31. –432	
16. 500	32. 232	

The drawing shows a plant in a pot in a dish.

16. The letter for each exercise is:

1. B	6. A	11. U	16. Y
2. L	7. R	12. M	17. O
3. S	8. C	13. K	18. D
4. I	9. N	14. T	19. G
5. H	10. P	15. E	

Answers: banded gecko, Komodo dragon, Pterosaur, Indian cobra, Asian reticulate python, ten meters

17.

1. 30	11. 3	21. 1296
2. 60	12. 2	22. –1
3. –20	13. 5	23. 7
4. –1/24	14. –3	24. 9
5. –126	15. 8	25. –32
6. 1	16. –33	26. 15
7. –5/4	17. 4	27. 0
8. 24	18. –60	28. –8
9. –2	19. –1000	29. –4
10. –¾	20. 4/3	30. 102

The drawing shows a ship and a sea serpent's tail.

18. Exercises match the blocks as follows.

M	11	21	24	2	5	19	9
17	A	14	1	16	13	10	23
8	4	T	23	25	7	20	3
18	W	15	H	6	I	12	Z

Answer: Math Whiz

19. Exercises match the blocks as follows.

1	18	27	4	25	11	3
23	7	20	W	15	26	28
12	21	O	6	I	10	22
9	H	14	2	17	5	8
16	24	13	5	19	29	E

Answer: How wise.

20. The letter for each exercise is as follows.

1. K	5. S	9. O	13. C
2. L	6. B	10. R	14. W
3. M	7. F	11. E	
4. T	8. I	12. A	

Answers: Afghan hound, Chihuahua, Great Dane, Karabash, Saluki, Weimaraner, Glen of Imaal terrier, Groenendael.

21.

1. 3^{-5}	15. 27	29. x^{-9}
2. x^{-4}	16. 2	30. 1/x
3. c^{-8}	17. 16	31. 49
4. 3^{-2}	18. 7	32. 5^3
5. 7^{-7}	19. 1/8	33. 1000
6. y^{-10}	20. 8	34. 0.0001
7. 8^{-3}	21. 3^{-6}	35. 0.1
8. $1/3^4$	22. x^{15}	36. 4^6
9. $1/2^3$	23. y^4	37. 1/49
10. $1/5^6$	24. w^{-10}	38. 36
11. $1/c^7$	25. x^5	39. 1/512
12. $1/e^9$	26. m^8	40. 81
13. $1/x^2$	27. p^{-4}	
14. $1/n^5$	28. 1	

The drawing shows a carafe with apples and grapes.

22. Exercises match the blocks as follows.

1	20	8	28	15	A	3	16
22	10	34	35	K	12	23	9
14	29	18	E	21	2	36	27
42	4	R	25	38	19	6	20
13	U	11	33	5	41	17	31
E	7	30	39	24	32	37	40

Answer: EUREKA

23. ACROSS: 1. –11; 3. –84; 5. 1010; 7. –88; 8. 14; 9. 1014; 11. –15; 12. –33; 14. 25; 15. –63; 17. 64; 19. –69; 21. –19; 22. 19; 24. –205; 26. 49; 27. –52; 28. 17; 29. 72

DOWN: 2. 3118; 4. 431; 6. 11; 8. 121; 10. 40; 11. –1662; 12. –336; 13. –17; 16. 10; 18. 41; 20. –100; 23. 1440; 25. 55

24. Exercises match the blocks as follows.

20	9	2	16	A	13	12	4	22	19
21	M	E	S	S	6	5	A	G	E
1	18	17	7	11	15	14	3	10	8

Answer: A MESSAGE

25.

1. Y	9. B	17. S	26. T
2. O	10. E	18. D	27. I
3. U		19. R	
	11. W	20. A	28. D
4. W	12. I	21. W	29. A
5. O	13. S	22. K	30. E
6. U	14. E	23. C	31. R
7. L		24. A	
8. D	15. T	25. B	
	16. O		

Answer: You would be wise to read it backwards.

26.

1. 7, 5	9. 25, –6	17. 3-1/3, 19
2. 2, –4	10. 4, 12	18. ½, –24
3. 9, 13	11. –2, 21	19. 4, 8
4. –6, –16	12. –9, –3	20. –24, 18
5. –7, 8	13. 2, –14	21. 5, –1
6. 3, –11	14. 0, –17	22. 0, –3
7. 21, 13	15. 7, –15	23. 18, 35
8. –14, 45	16. 3-1/3, 3	24. –16, 2000

The diagram is a pair of interlocking squares.

27. Exercises match the blocks as follows.

14	9	13	I	4	17	12	20
6	11	19	C	1	15	22	24
7	2	16	U	8	23	18	3
S	M	A	R	T	10	21	5

Answer: I C U R SMART (I see you are smart.)

28.

1. –7, 4	9. 1/3, 3	17. 12, 1.2
2. –8, 5	10. 1/3, –½	18. 5, 10
3. 12, 4	11. 0, –11	19. 7, 0.1
4. –9, –11	12. 0.1, 10	20. 0, 4
5. 5, 7	13. 10, 3	21. –7, –11
6. –½, –8	14. –9, 1.2	22. –9, 1-2/3
7. 1-2/3, 12	15. 1/3, 1/10	
8. 0, 1.2	16. –8, 3	

Lines from the vertices of the squares intersect at a central point.

29.

1. 6123	152
2. 25	2 56
3. 24	381
4. 121	2 64
5. 56	1011
6. 242	2
7. 12	42330
8. 381	4
9. 63	11. 42 330
10. 1041	12. 81.6

30. The letter for each exercise is as follows.

1. H	9. S	17. B
2. M	10. F	18. K
3. A	11. T	19. U
4. X	12. R	20. C
5. V	13. Y	21. P
6. Z	14. G	22. F
7. D	15. I	
8. J	16. E	

The drawing is a butterfly.

31. The letter for each exercise is as follows.

1. K	11. G	21. T	31. C
2. W	12. N	22. C	32. L
3. P	13. G	23. R	33. I
4. V	14. L	24. A	34. U
5. P	15. E	25. E	35. H
6. R	16. M	26. A	
7. R	17. I	27. O	
8. N	18. O	28. D	
9. D	19. S	29. V	
10. W	20. E	30. P	

Answers: American Goshawk, European Coot, Golden Plover, Victorian Crowned Pigeon

32. The letter for each exercise is as follows.

1. T	8. I	15. I	22. S
2. O	9. R	16. J	23. A
3. E	10. P	17. L	24. N
4. D	11. K	18. E	25. A
5. H	12. I	19. T	26. F
6. C	13. L	20. U	
7. B	14. M	21. W	

1950: Nino Farina
1960: Jack Brabham
1961: Phil Hill
1967: Denis Hulme
1970: Jochen Rindt
1973: Jackie Stewart
1974: Emerson Fittipaldi

33. The exercise number for each block is as follows.

13	3	H	10	24
20	23	A	17	22
8	1	R	16	6
18	19	R	A	Y
11	7	O	14	1911
15	25	U	21	2
3	9	N	4	12

Answer: Ray Harroun, 1911

34. Figures are positioned as follows.

Trapezoid (5, 10, 16, 19)
Right Triangle (1, 12, 14)
Rectangle (3, 8, 9, 15)
Pentagon (2, 6, 11, 13, 17)
Parallelogram (4, 7, 18, 20)

35. 1. $42x$
2. $6x^2 - 15x$
3. $-5x^4 + 5x^3$
4. $x^2 - x - 42$
5. $x^2 - 10x + 16$
6. $6x^2 - 5x - 6$
7. $15x^{26} + 12x^{11}$
8. $6x$
9. $-0.92x^8$
10. $9y^2 - 1$
11. $16x^2 - 0.01$
12. 0
13. $8a^7$
14. x
15. x^3
16. $x^2 + 12x + 32$
17. $-8x^2 + 12x$
18. $4x^2 - 12x + 9$
19. $-15x^4 + 10x^3$
20. $-100x^{20}$
21. x^9
22. $-x^2$
23. $-8x^{10}$
24. $-6y^7 + 3y^3$
25. x^7
26. $x^{12} - x^{10}$
27. $6x^5 - 12x^3$
28. $9x^2 - 121$
29. $x^2 + 16x + 64$
30. $x^2 - 3x + 2$
31. x^2
32. x^6
33. x^{52}
34. $2y^2 - 7y + 5$
35. $x^5 + x^3 - 2x^2 - 2$
36. $-4x^4$

The drawing shows a dog.

36. The exercise numbers for each block are as follows.

16	18	3	11	VIN
22	12	8	1	14
5	20	15	19	CU
21	17	2	10	4
9	7	13	6	LUM

Answer: VINCULUM

37. The letters for each exercise are as follows.

1. R	8. P	15. B	22. E
2. F	9. M	16. N	23. H
3. H	10. A	17. O	24. C
4. Y	11. E	18. S	25. N
5. N	12. K	19. G	26. I
6. O	13. T	20. P	27. L
7. S	14. C	21. M	

Answers: sponge, anenome shrimp, stonefish, manta ray, gooseneck barnacles

38.

A	B
1. $x^2 - 36$	1. $x^2 - 20x + 100$
2. $9x^2 - 4$	2. $4x^2 - 25$
3. $x^4 - 2x^2 + 1$	3. $9x^4 - 6x^2 + 1$
4. $x^2 + 10x + 25$	4. $1 - 6x^2 + 9x^4$
5. $4x^2 - 12x + 9$	5. $4 - 4x + x^2$
6. $x^2 + 10x + 25$	6. $4 - 12x^3 + 9x^6$
7. $9x^2 - 6x^3 + x^4$	7. $9x^2 - 4$
8. $x^2 - 324$	8. $4x^2 - 12x + 9$
9. $100 - 20x + x^2$	9. $x^2 - 121$
10. $x^4 - 2x^2 + 1$	10. $4 - 12x^3 + 9x^6$

The drawing shows overlapping concave quadrilaterals.

39. The exercise number for each block is as follows.

12	3	18	Melbourne	2
25	6	14	11	21
13	19	7	20	10
Berlin	22	26	4	24
1	5	15	28	17
9	23	16	8	27

40. The exercise number for each block is as follows.

16	22	4	25	2	11
1	28	29	15	7	13
19	6	23	5	Ans.	26
8	18	27	10	3	17
20	14	24	9	12	21

Answer: July 20, 1969

41. The picture shows a beach umbrella and a lounge chair.

42. The letter for each exercise is as follows.

1. V	7. G	13. Y	19. Z
2. J	8. U	14. A	20. B
3. O	9. T	15. E	21. I
4. W	10. C	16. N	22. M
5. S	11. L	17. D	23. H
6. P	12. F	18. R	24. K

Answers: Montgolfier, Colt, Pascal, Benz, Sikorsky, Vail, Hills, Gorrie, Swinton, Judson

43. The exercise number for each block is as follows.

3	10	8	16	M
23	22	6	24	E
27	29	30	26	28
14	20	13	11	T
5	25	1	17	E
7	19	12	15	R
21	4	18	9	2

Answer: Meter

44.

1. $-2, -5$	9. $-2, 4/3$	17. $4, 1$
2. $-3, -8$	10. $7, 8$	18. $11, -\frac{1}{2}$
3. $7, 1$	11. $-\frac{1}{2}, 2/3$	19. $0, -3/5$
4. $9, 2$	12. $4/3, -9$	20. $1/3, -1/3$
5. $-8, 5$	13. $0, 2$	
6. $6, -4$	14. $9, -3/5$	21. $-4, -1/3$
7. $11, -11$	15. $4, 8$	22. $-11, 2/3$
8. $5, -3/2$	16. $-3, -3/2$	23. $6, 1/3$
		24. $-9, -5$

The drawing shows a 12-sided figure with six quadrilateral petals.

45. The exercise number for each block is as follows.

5	N	O	1	6	3
11	8	10	12	7	9
4	L (blank)		C	K	2

Answer: No luck without u!

46. The drawing shows an eagle, wings spread for landing.

47. HOW I WISH / I COULD RECOLLECT / IN SIMPLE TERMS ITS / VALUE!

Answer: 3.1415926535

48. The letter for each exercise is as follows.

READ BETWEEN THE LINES.

49. The shaded squares are indicated by *.

*	*	*	*	A
Y	H	*	M	*
O	*	*	*	*
*	A	*	E	L
*	N	I	*	I
U	D	*	*	*
R	*	N	*	N
E	*	G	*	E

Answer: You're handing me a line.

50. No. 2 hits (1, –3); No. 5 hits (–2, 2); No. 7 hits (–7, 3); No. 8 hits (8, 5); No. 9 hits (4, 10); No. 12 hits (5, –3); No. 13 hits (3, 6); No. 15 hits (–9, 0)

51.

1. $31.55	4. 45	7. 51.50
2. 500	5. 15.75	8. 5.80
3. 57	6. 31.65	

Draw segments from 51.50 to 500, from 31.65 to 57, from 5.80 to 31.55, and from 15.75 to 5.80.

52.

1. 3	9. 7/8	17. 7
2. –1	10. $-\frac{1}{4}$	18. 0
3. 2	11. 4	19. 8
4. –2	12. 1	20. 11
5. 6	13. 9/5	21. –7
6. –8	14. 2/3	22. 9
7. $\frac{1}{2}$	15. –5	23. –3
8. 5/3	16. 5	24. 100
		25. –6

The picture shows a person fishing.

53.

1. $-2, 7$	9. $-2, -\frac{1}{4}$
2. $2/3, -5$	10. $8, \frac{1}{2}$
3. $1, 8$	11. $0, 4/5$
4. $\frac{1}{4}, 2/3$	12. $-1, 1$
5. $-1/3, -\frac{1}{4}$	13. $-1/3, 2/3$
6. $1, 0$	14. $7, 8$
7. $4/5, -5$	15. $4/5, -2$
8. $-1, -1/3$	

The drawing shows a star-shaped design of six congruent triangles.

54. The letter for each exercise is as follows.

1. I	5. T	9. D	13. F
2. M	6. S	10. O	14. I
3. U	7. A	11. T	15. N
4. S	8. Y	12. S	16. E

Answer: I must say, "Dot's fine!" (That's fine.)

55.

1. (3, 10)	9. (7, 10)	17. (8, 9)
2. (5, 9)	10. (–21, 7)	18. (5, –21)
3. (11, 4)	11. (8, 6)	19. (–5, 5)
4. (8, –2)	12. (9, 7)	20. (–5, 6)
5. (6, 12)	13. (–21, 3)	21. (9, 6)
6. (3, –5)	14. (–2, –5)	22. (9, –21)
7. (5, –2)	15. (3, –2)	23. (5, 4)
8. (10, 8)	16. (7, 11)	24. –21, –5)

The outside segments form a square. An octagon is at the center. One parallelogram has vertices at 9, 6, –5, 10. Another is at 5, 11, –21, –2. There are several obtuse triangles. One has its vertices at 9, –21, 7.

56.

1. (10, 5)	11. (11, −3)	21. (7, 5)
2. (12, 4)	12. (−10, 1)	22. (4, −2)
3. (7, −3)	13. (3, −1)	23. (2, 1)
4. (4, −8)	14. (−6, 2)	24. (−5, 11)
5. (−5, −7)	15. (4, −5)	25. (6, −6)
6. (7, 11)	16. (3, −7)	26. (7, −5)
7. (8, −2)	17. (−3, 7)	27. (6, 7)
8. (9, −1)	18. (7, −1)	28. (5, 5)
9. (6, 4)	19. (8, −2)	29. (30, 40)
10. (3, −4)	20. (5, 1)	30. (35, 4)
		31. (9, 4)

The drawing shows a flower.

57. ACROSS: 2. 11; 5. 512; 7. 210; 9. 12; 11. 16; 12. 135; 14. 57; 16. 56; 17. 15

DOWN: 1. 15; 3. 121; 4. 40; 6. 213; 8. 16; 10. 25; 12. 176; 13. 18; 14. 55; 15. 13

58. The exercise number for each block is as follows.

4	Motion	7	2	Problems
Make	3	6	Many	128
Students	5	Dizzy	8	1

59. Exercise numbers for each block are as follows.

5	13	1	2	8	4
3	10	9	11km	2	14
Pacific	6	15	7	16	11

60. The letters for each exercise are as follows.

1. I	9. E	17. I	25. D
2. G	10. Q	18. W	26. L
3. H	11. U	19. P	27. A
4. S	12. S	20. N	28. L
5. N	13. L	21. S	29. L
6. U	14. A	22. L	30. Z
7. A	15. U	23. S	31. Q
8. O	16. E	24. U	32. I

Answers: Zululand, Spanish Wells, Iquique, Lagos

61. The drawing shows a guitar.

62. The exercise numbers for each box are as follows.

4	20	16	13	8	Wolf	6	spider
27	33	22	30	18	26	14	9
10	28	37	23	35	2	1	29
19	21	7	38	32	24	34	17
3	15	25	11	12	31	36	5

63. The letter for each exercise is as follows.

1. W	12. D	23. R	34. L
2. H	13. Y	24. L	35. E
3. O	14. A	25. E	36. R
4. I	15. S	26. Y	37. M
5. E	16. O	27. U	38. H
6. U	17. I	28. D	39. K
7. T	18. N	29. E	40. B
8. N	19. O	30. N	41. O
9. L	20. O	31. S	42. I
10. S	21. N	32. D	43. D
11. W	22. O	33. N	44. W

Answer: Sid. Sid Who? Sid down and I'll tell you.

Ben. Ben Who? Ben doing your homework?

64. The exercise number for each block is as follows.

19	17	22	1	18
12	6	5	3	9
23	14	27	20	7
ans.	26	25	13	11
15	2	21	10	4
8	28	29	16	24

65.

	A	B
1.	$6b - 3c$	$-2c$
2.	$2x^2y^2 - 2a^2b^2$	$a - 5b$
3.	$-11a + 11b + 5c$	$a^3b^4 + 2a^2b^2 - 3ab^2 - 6$
4.	$2xy$	$10x^2$
5.	$2xy$	$2a^2 - 9ab + 9b^2$
6.	$6x^2 + xy - y^2$	$-11a + 11b + 5c$
7.	$x^3 - y^3$	$-2c$
8.	$3x^3 + 2xy^2 + x^2y$	$6b - 3c$
9.	$-c$	$a^3 - b^3$
10.	$6x^2 + xy - y^2$	$2a^2 - 9ab + 9b^2$
11.	$-8b$	$6x^2y - 2xy$
12.	$9m^{10} - a^2c^2$	$-a + 5b$
13.	$-2c$	$-2a$
14.	$-2a$	$-8b$
15.	$3x^3 + 2xy^2 + x^2y$	$-2a$
16.	$6xy^2$	$10x^2$
17.	$-2xy + 6x^2y$	$a^3b^4 + 2a^2b^2 - 3ab^2 - 6$
18.	$2x^2y^2 - 2a^2b^2$	$2a^2 - 9ab + 9b^2$
19.	$a^3b^4 + 2a^2b^2 - 3ab^2 - 6$	$3x^2 - y^2$
20.	$9m^{10} - a^2c^2$	$x^3 - y^3$

The drawing is one ten-sided figure inside another, with corresponding vertices connected.

66. The drawing shows a telephone.

67. The exercise number for each block is as follows.

19	26	3	13	16
7	25	20	4	22
27	24	30	8	17
C	5	18	1	14
U	9	23	28	6
T	2	10	31	12
E	21	29	11	15

68. The drawing shows a rural mail box full of wrapped boxes.

69. The letter for each exercise is as follows.

1. T	10. Y	19. O	28. A
2. E	11. A	20. M	29. E
3. I	12. C	21. I	30. F
4. H	13. E	22. S	31. I
5. R	14. M	23. E	32. B
6. G	15. L	24. R	33. D
7. S	16. A	25. M	34. N
8. M	17. A	26. U	
9. O	18. B	27. L	

Answers: Martha, Ida, Florence, Lou, Bess, Mary, Mamie, Abigail

70. The exercise number for each block is as follows.

2	14	17	4	10	3
20	5	6	Racing	21	12
8	11	Cycle	18	15	1
19	Motor	13	16	9	7

Answer: Motorcycle Racing

71. The drawing shows a pair of pliers.

72. The letter for each exercise is as follows.

1. S	8. L	15. T
2. A	9. A	16. O
3. K	10. Y	17. T
4. L	11. L	18. R
5. I	12. H	19. E
6. M	13. E	20. E
7. P	14. W	21. R

Answer (read every other letter): Skip a letter.

73. The exercise number for each block is as follows.

9	13	1	10	2
19	7	16	18	P
12	4	8	3	14
17	22	21	23	I
20	6	15	5	11

Answer: Pi (π)

74. The letter for each exercise is as follows.

1. U	7. I	13. S	19. N
2. C	8. U	14. S	20. L
3. E	9. A	15. R	21. G
4. P	10. S	16. I	22. O
5. A	11. C	17. E	23. G
6. Y	12. N	18. M	24. D

Answers: Draco, Gemini, Cygnus, Pegasus, Lepus

75. The picture shows a mountain range and its reflection in a lake.

76. The letter for each exercise is as follows.

1. D	5. S	9. E	13. C
2. U	6. B	10. P	14. T
3. N	7. O	11. M	15. L
4. I	8. A	12. R	16. F

Answers: Lemniscate of Bernoulli, Astroid, folium of Descartes, limacon of Pascal

77. Exercises match the blocks as follows.

20	C	6	14	17	4
2	12	H	24	10	22
18	25	23	A	1	13
9	5	16	19	M	7
15	21	3	11	8	P

Answer: CHAMP

78. The letters for each exercise are:

1. V	6. H	11. Y	16. B
2. E	7. N	12. S	17. C
3. G	8. L	13. L	18. O
4. T	9. R	14. M	19. U
5. A	10. I	15. R	20. Z

Answers: Baum, Irving, Orczy, Shelley, Scott, Salinger, Uris, Melville

79.

1. 13	10. 4 or −3	19. 8
2. 3-9/14	11. 5 or −2	20. 1-2/3
3. −8	12. 7 or −3	21. −2
4. −3-8/9	13. 3¾	22. 1
5. 2	14. 3-1/3	23. 11
6. 2-2/5	15. 12	24. 1/3
7. −2 or −1	16. 10	25. −1-4/11
8. −5 or −1	17. 5	
9. −6 or 3	18. 14	

The drawing shows a lamp symmetric about a vertical axis.

80. The letters for each exercise are as follows.

1. A	6. E	11. S	16. B
2. O	7. I	12. N	17. G
3. P	8. R	13. C	18. L
4. M	9. T	14. K	
5. H	10. U	15. D	

Answers: bed, brace, gam, pod, span, mob, gaggle, pride, clutch, crash, business, knot

81. (Speed is not given as a ratio.)

1. 1:5	9. 3:1	17. 30
2. 15:1	10. 1188	18. 32
3. 80	11. 7.5	19. 21 000
4. 4:1	12. 10	20. 40
5. 1:3	13. 5-1/3	21. 375
6. 0.35:1	14. 4	22. 28.8
7. 0.90:1	15. 18.2	23. 20, 28
8. 90	16. 37.2	

The drawing shows an apple with one bite missing.

82.

1. 2800	1	
2. 3250	28	
3. 75	3 0	
4. 6	2800	
5. 500	5	
6. 400	450	8. 28
7. 450	7 0 6 500	9. 1800

83. Exercises match the blocks as follows.

7	18	11	27	2	21	4	12
13	28	1	14	37	team	24	26
23	5	33	19	your	31	15	36
6	30	35	for	3	8	29	34
32	17	root	25	38	10	16	9

Answer: Root for your team.

84. The inner circle starting at $\sqrt{16}$ is alternately shaded and blank. The middle circle starting at $-\sqrt{1}$ is alternately shaded and blank. All large outer pieces are shaded. Narrow pieces labelled $-\sqrt{9}$, $\sqrt{64}$, and $\sqrt{49}$ are shaded.

85.

1. $\sqrt{15}$ and 6
2. $\sqrt{14}$ and $\sqrt{35}$
3. 11 and 45
4. $\sqrt{38}$ and $\sqrt{11}$
5. $\sqrt{2/21}$ and 15
6. $\sqrt{3x}$ and $\sqrt{7a}$
7. $\sqrt{x^2 - 2x}$ and 15
8. $\sqrt{x^2 + 6x}$ and 1
9. 6 and $\sqrt{2/21}$
10. $\sqrt{38}$ and 8
11. $\sqrt{14}$ and $\sqrt{x^2 - 16}$
12. $\sqrt{x^2 + 6x}$ and $\sqrt{11}$
13. 11 and $\sqrt{x^2 - 16}$
14. 8 and $\sqrt{35}$
15. 1 and $\sqrt{x^2 - 2x}$
16. $\sqrt{3x}$ and 45

The drawing "spirals" counter clockwise from $\sqrt{7a}$ to $\sqrt{15}$.

86.

1. $5\sqrt{2}$	21. $\sqrt{30}\sqrt{y}$
2. $3\sqrt{2}$	22. $3\sqrt{2}\sqrt{x}$
3. $7\sqrt{2}$	23. 10y
4. $5\sqrt{3}$	24. 9 m
5. $10\sqrt{3}$	25. 6 k
6. $10\sqrt{7}$	26. $\sqrt{x-3}\sqrt{x+3}$
7. $2\sqrt{5}\sqrt{x}$	27. $\sqrt{x+4}\sqrt{x+5}$
8. $4x\sqrt{3}$	28. $\sqrt{19}\sqrt{x}$
9. $6\sqrt{2t}$	29. $x\sqrt{35}$
10. $x\sqrt{15}$	30. $12\sqrt{x}$
11. $\sqrt{7}\sqrt{x}$	31. 12.25
12. $2\sqrt{x+4}$	32. 14.14
13. $\sqrt{x-1}\sqrt{x+1}$	33. 16.43
14. $\sqrt{x-2}\sqrt{x+2}$	34. 11.31
15. $\sqrt{x^2 + y^2}$	35. 16.70
16. $x - y$	36. 31.62
17. $7x\sqrt{x}$	37. 22.36
18. $\sqrt{3x-1}\sqrt{x+2}$	38. 19.90
19. $\sqrt{a-b}\sqrt{a+b}$	39. 19.36
20. $6\sqrt{y}$	40. 54.77

The drawing shows a conch shell.

87. The letters for each exercise are as follows.

1. R	7. U	13. J	19. W
2. A	8; T	14. Q	20. S
3. G	9. V	15. L	21. E
4. V	10. P	16. R	22. H
5. O	11. N	17. I	23. C
6. Y	12. E	18. B	24. K

Answers: joey, leveret, parr, squab, cygnet, cheeper, elver, white coat, spock, kit, eyas

88. Exercises match the blocks as follows.

14	22	S	9	15	6	11	4
5	28	P	U	P	12	I	L
7	13	24	1	P	19	23	27
16	30	10	25	15	E	26	18
31	3	21	8	20	2	R	29

Answer: Super pupil

89.

1. $5\sqrt{3}$	11. $7\sqrt{3}$	21. $7x^2\sqrt{2x}$
2. $6\sqrt{5}$	12. $3\sqrt{5}$	22. $3\sqrt{3x+3}$
3. $2\sqrt{x}$	13. $3\sqrt{3}$	23. $2\sqrt{2x-2}$
4. 0	14. $7\sqrt{2}$	24. $7xy\sqrt{xy}$
5. $\sqrt{2}$	15. $8\sqrt{3}$	25. $(4/5)\sqrt{5}$
6. $9\sqrt{x}$	16. $6\sqrt{2}$	26. $5(x-y)$
7. $5\sqrt{a}$	17. $5\sqrt{2}$	$\sqrt{3(x-y)}$
8. $7\sqrt{a}$	18. $4\sqrt{3}$	27. $(6/7)\sqrt{7}$
9. $4\sqrt{x}$	19. $9x\sqrt{2}$	28. $8\sqrt{2}$
10. $9\sqrt{2}$	20. $3x\sqrt{x}$	29. $(7/6)\sqrt{3}$
		30. $-(1/28)\sqrt{14}$

90. The letters for each exercise are as follows.

1. I	8. D	15. F	22. M
2. B	9. O	16. W	23. L
3. U	10. E	17. T	24. V
4. N	11. P	18. G	25. J
5. A	12. A	19. H	26. S
6. K	13. C	20. I	
7. R	14. N	21. Y	

Answers: Dennis Gabor, Andrei Sakharov, Ernest Hemingway, Linus Pauling, Francis Crick, James Watson, Maurice Wilkins

91. ACROSS: 1. 16; 2. 225; 3. .1; 4. 35; 5. 159; 8. 135; 9. 4; 10. 13; 11. 30; 12. 1312; 14. 124; 17. 23; 18. 29

DOWN: 1. 100; 2. 25; 3. .12; 4. 37; 5. 13; 6. 55; 7. 93; 8. 173; 9. 400; 10. 141; 12. 143; 13. 144; 15. 22; 16. 32

92. The letters for each exercise are as follows.

1. E	9. V	17. R	25. U
2. R	10. D	18. E	26. S
3. L	11. I	19. T	27. G
4. I	12. G	20. R	28. A
5. F	13. C	21. E	29. E
6. H	14. E	22. R	30. M
7. T	15. U	23. C	31. A
8. O	16. Y	24. S	32. H
			33. T

Answer: Give yourself credit. Use Mathtercharge

93. Exercises match the blocks as follows.

10	(1808)	24	1	15	26	DAVY
8	25	13	9	18	6	20
32	2	33	30	23	27	3
21	31	28	5	17	22	11
14	19	4	12	16	29	7

94.

1. 4, −10	8. −6, −8
2. 3, −7	9. $-5-\sqrt{7}, -5+\sqrt{7}$
3. −3, −5	10. $2-\sqrt{3}, 2+\sqrt{3}$
4. 12, 0	11. $-1-\sqrt{5}, -1+\sqrt{5}$
5. 11, 5	12. $6-\sqrt{2}, 6+\sqrt{2}$
6. 21, −1	13. $2-\sqrt{11}, 2+\sqrt{11}$
7. −2, 6	

Answer: MATH (M:1, A:7, T:−11, H:8)

95. The letters for each exercise are as follows.

1. L	8. G	15. I	22. M
2. T	9. N	16. F	23. Z
3. H	10. Q	17. O	24. S
4. R	11. A	18. D	25. Y
5. P	12. V	19. K	26. U
6. C	13. Y	20. E	
7. W	14. B	21. X	

Answers: New Delhi, Lima, Kingston, Quezon City, Yakarta, Bridgetown, Suva, Mexico City, Sofia, Cairo, Prague

96. Exercises match the blocks as follows.

17	11	30	19	25	L
7	12	24	26	O	22
2	18	9	G	14	13
28	4	O	1	10	29
23	O	3	8	16	71
G	15	6	20	5	27

Answer: Goógol

97. The letters for each exercise are as follows.

1. E	7. L	13. K
2. J	8. A	14. Z
3. G	9. W	15. B
4. Q	10. N	16. X
5. C	11. P	17. H
6. R	12. D	18. T

The drawing shows a windmill.

98. The A and B answers are as follows.

1. 2 and 1½	5. 24 and 3
2. 11 and 10	6. 12 and 16
3. 7 and 15	7. 13 and 5
4. 4 and 20	

Answer: LOVE

99. Exercises match the blocks as follows.

2	lose	5	8
Don't	6	1	4
9	7	3	interest

Answer: Don't lose interest

100.

1. 8	4. 20	7. 30
2. 12	5. 5	8. 35
3. 9	6. 6	

It is possible to draw two hexagons with this figure.

101. The graphs of 1, 7, 3, and 4 are congruent and connect at -6, -2, and 2. The graphs of 5, 2, and 6 are congruent to 1, but open downward. Put together they form a friendly snake whose head is the graph of 8.

102. Blanks occur in Row 1 at T and Y; in Row 2 at E, D, and the second T; in Row 3 at G, A, E, and T; in Row 4 at E, G, E, and O; in Row 5 at R, S, and G.

Answer (read diagonally): Get ready, get "set," go!

103. The exercise number of each block is as follows.

5	13	18	8	2
G	3	19	12	T
15	9	M	20	22
E	6	14	1	R
S	21	E	10	17
O	4	16	7	Y

Answer: Geometry (Gee, I'm a tree!)

104. The letter for each exercise is as follows.

1. I	6. R	11. S	16. L
2. N	7. C	12. B	17. O
3. U	8. V	13. A	18. W
4. P	9. M	14. E	
5. H	10. T	15. X	

Answers: Saturn, Vulcan, Apollo, Thunder, Iris, Mars, Diana, Eros, Bacchus, Athene, Owl

105. The exercise number for each block is as follows.

13	17	6	4
2	19	10	16
C	A	1	7
5	N	D	14
9	3	11	Y
12	15	18	8

Answer: Candy

106.

1. 10	9. 31	17. 99	25. ½
2. 8	10. 9	18. 13	26. 6.4
3. 1	11. -5	19. 49	27. $-\frac{3}{4}$
4. -1	12. 0	20. -99	28. 0.4
5. -6	13. -8	21. 6	29. $-\frac{1}{2}$
6. -3	14. 161	22. 3	30. $-\sqrt{6}$
7. 15	15. 11	23. 4	
8. 19	16. -2	24. 7	

The drawing shows an airplane.

107.

P: 1, 6, 11, 17
E: 5, 8, 14, 18
A: 4, 9, 12, 19
C: 2, 13, 15
E: 3, 7, 10, 16

108. The drawing shows a carved pumpkin.

Left eye: 1, 9
Right eye: 5, 10
Nose: 3, 11
Mouth: 6, 12
Edge: 7, 4, 8, 2

109.

1. k	9. 6	17. 8	25. 1.4
2. m	10. 15	18. 35	26. 0.4
3. p	11. 30	19. 16½	27. 0.5
4. a	12. 21	20. 7-1/3	28. 1/6
5. w	13. 3-1/3	21. 1	29. 1/7
6. c	14. 18	22. 10-2/7	30. 9
7. 5	15. 27½	23. 50	
8. 3½	16. 3¾	24. 0.6	

The drawing shows a camera.

110. The exercise number for each letter is as follows.

O	10	3	18	6	K
7	15	1	17	4	2
13	9	8	14	20	19
A	16	11	5	12	Y

Answer: OKAY

111. The letter for each exercise is as follows.

1. D	6. I	11. L	16. Z
2. O	7. N	12. S	17. T
3. P	8. K	13. F	18. G
4. U	9. E	14. A	19. G
5. Y	10. R	15. C	

Answers: Krone, Ringgit, Zloty, Franc, Kip, Rupee, Escudo

112.

1. 0.1736	9. 72	17. 9
2. 0.9659	10. 47	18. 0.6293
3. 0.9135	11. 62	19. 68
4. 11.4301	12. 0.6018	20. 0.1944
5. 0.6009	13. 0.1219	21. 73
6. 0.5000	14. 58	22. 0.4848
7. 0.7660	15. 1.7321	23. 8
8. 2	16. 40	24. 15
		25. 5

The drawing is a rose.

113. The exercise number for each block is as follows.

D	15	1	8	3
12	O	9	6	10
4	14	N	16	2
5	13	7	E	11

Answer: Done