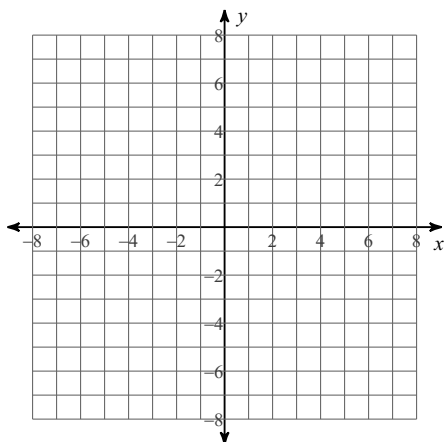


Area/Volume Practice 4-16

Date _____ Period _____

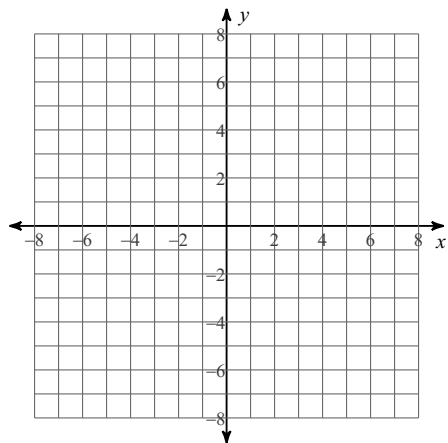
For each problem, find the area of the region enclosed by the curves. You may use the provided graph to sketch the curves and shade the enclosed region.

$$1) y = \frac{x^2}{2} - 4, y = -\frac{x^2}{2} - 2x - 1$$



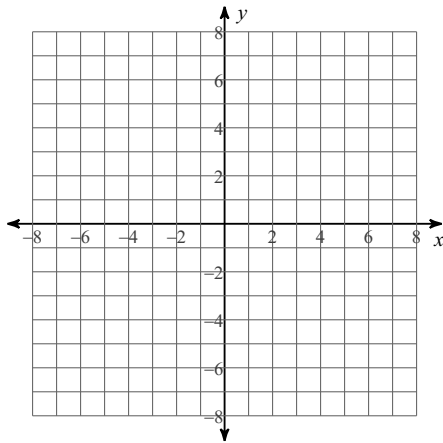
For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the x -axis. You may use the provided graph to sketch the curves and shade the enclosed region.

$$2) x = 2, x = \sqrt{y}, y = 0$$



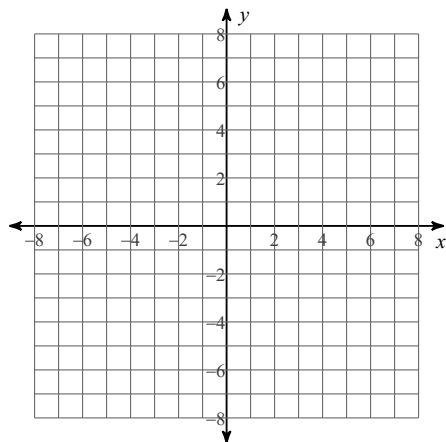
For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the y -axis. You may use the provided graph to sketch the curves and shade the enclosed region.

3) $y = \sqrt{4 - x}$, $y = 0$, $x = 0$



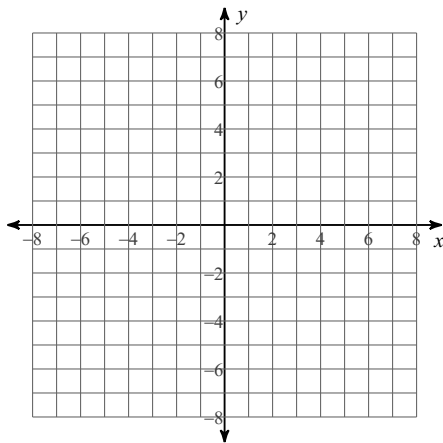
For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the x -axis. You may use the provided graph to sketch the curves and shade the enclosed region.

4) $y = x^2 + 2$, $y = 2$, $x = 1$



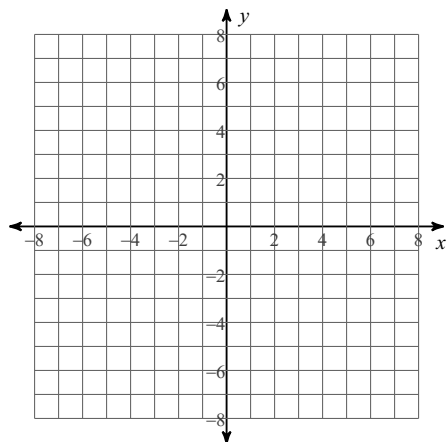
For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the y -axis. You may use the provided graph to sketch the curves and shade the enclosed region.

5) $y = 2x - 2$, $y = x^2 - 2x + 1$

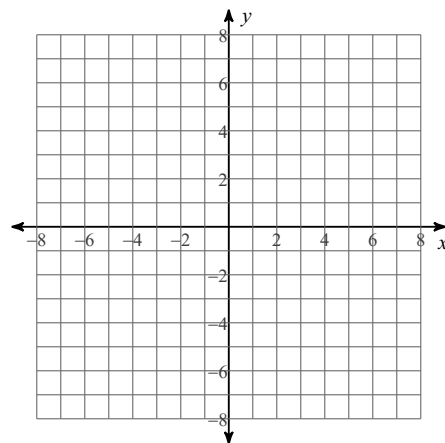


For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the given axis. You may use the provided graph to sketch the curves and shade the enclosed region.

6) $y = -x^2 + 3$, $y = 2$, $x = 0$, $x = 1$
Axis: $y = 2$



7) $x = y^2 + 2$, $x = 1$, $y = -2$, $y = 0$
Axis: $x = -2$

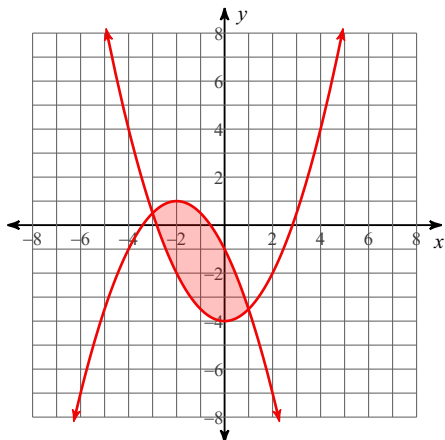


Area/Volume Practice 4-16

Date _____ Period _____

For each problem, find the area of the region enclosed by the curves. You may use the provided graph to sketch the curves and shade the enclosed region.

$$1) y = \frac{x^2}{2} - 4, y = -\frac{x^2}{2} - 2x - 1$$

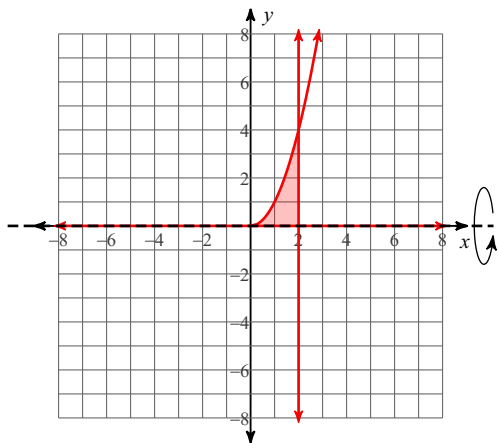


$$\int_{-3}^1 \left(-\frac{x^2}{2} - 2x - 1 - \left(\frac{x^2}{2} - 4 \right) \right) dx$$

$$= \frac{32}{3} \approx 10.667$$

For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the x-axis. You may use the provided graph to sketch the curves and shade the enclosed region.

$$2) x = 2, x = \sqrt{y}, y = 0$$

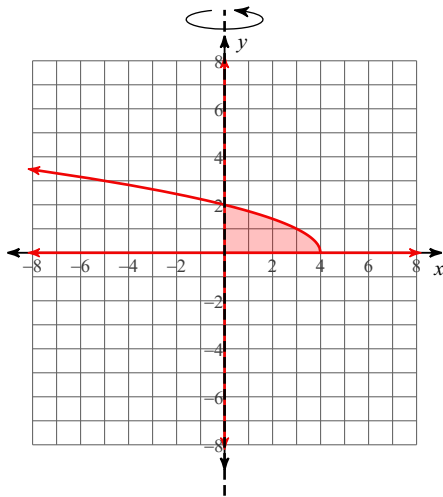


$$\pi \int_0^2 (x^2)^2 dx$$

$$= \frac{32}{5} \pi \approx 20.106$$

For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the y -axis. You may use the provided graph to sketch the curves and shade the enclosed region.

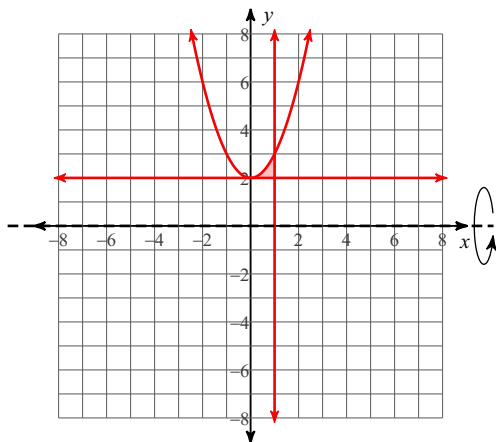
3) $y = \sqrt{4 - x}$, $y = 0$, $x = 0$



$$\begin{aligned} & \pi \int_0^2 (-y^2 + 4)^2 dy \\ &= \frac{256}{15} \pi \approx 53.617 \end{aligned}$$

For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the x -axis. You may use the provided graph to sketch the curves and shade the enclosed region.

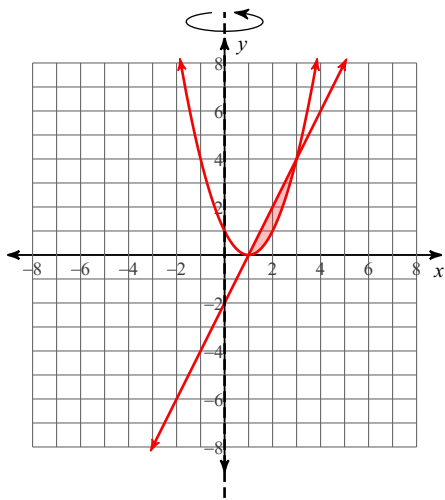
4) $y = x^2 + 2$, $y = 2$, $x = 1$



$$\begin{aligned} & \pi \int_0^1 ((x^2 + 2)^2 - 2^2) dx \\ &= \frac{23}{15} \pi \approx 4.817 \end{aligned}$$

For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the y -axis. You may use the provided graph to sketch the curves and shade the enclosed region.

5) $y = 2x - 2$, $y = x^2 - 2x + 1$

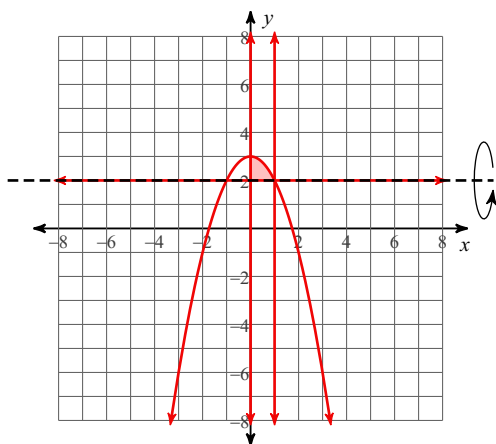


$$\pi \int_0^4 \left((\sqrt{y} + 1)^2 - \left(\frac{y}{2} + 1 \right)^2 \right) dy$$

$$= \frac{16}{3} \pi \approx 16.755$$

For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the given axis. You may use the provided graph to sketch the curves and shade the enclosed region.

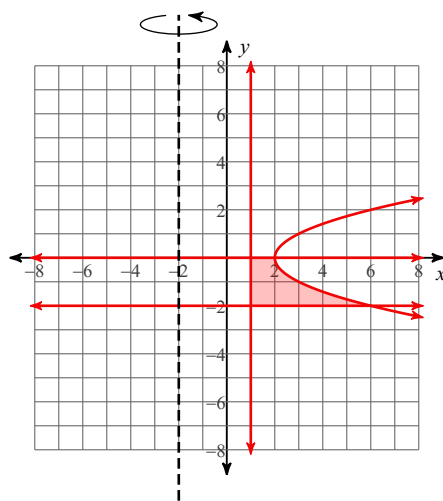
6) $y = -x^2 + 3$, $y = 2$, $x = 0$, $x = 1$
Axis: $y = 2$



$$\pi \int_0^1 (-x^2 + 1)^2 dx$$

$$= \frac{8}{15} \pi \approx 1.676$$

7) $x = y^2 + 2$, $x = 1$, $y = -2$, $y = 0$
Axis: $x = -2$



$$\pi \int_{-2}^0 \left((y^2 + 4)^2 - 3^2 \right) dy$$

$$= \frac{626}{15} \pi \approx 131.109$$