**AP Calculus AB**

**Vocabulary Review - Solutions**

**When you see the words …. This is what you think of doing**

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| 1. Find the zeros | Set function = 0, factor or use quadratic equation if quadratic, graph to find zeros on calculator |
| 2. Find equation of the line tangent to  on | Take derivative -  and use |
| 3. Find equation of the line normal to  on | Same as above but |
| 4. Find the interval where  is increasing | Find , set both numerator and denominator to zero to find critical points, make sign chart of  and determine where it is positive. |
| 5. Find interval where the slope of  is increasing | Find the derivative of *f ‘*(x), set both numerator and denominator to zero to find critical points, make sign chart of  and determine where it is positive. |
| 6. Find the minimum value of a function | Make a sign chart of , find all relative minimums and plug those values back into  and choose the smallest. |
| 7. Find the minimum/maximum rate of change of a function | Make a sign chart of the derivative of *f* ‘(x), find all relative mins/maxes and plug those values back into  and choose the smallest/largest. |
| 8. Find critical values | Express  as a fraction and set both numerator and denominator equal to zero. |
| 9. Find inflection points | Express  as a fraction and set both numerator and denominator equal to zero. Make sign chart of  to find where  changes sign. (+ to – or – to +) |
| 10. Show that  exists | Show that |
| 11. Show that  is continuous | Show that 1)  exists ()  2)  exists  3) |
| 12. Find vertical asymptotes of | Do all factor/cancel of  and set denominator = 0 |
| 13. Find horizontal asymptotes of | Find  and |
| 14. Find the average rate of change of  on | Find |
| 15. Find instantaneous rate of change of at *a* | Find |
| 16. Find the absolute maximum of  on | Make a sign chart of , find all relative maximums and plug those values back into  as well as finding and  and choose the largest. |
| ~~17. Show that a piecewise function is differentiable~~  ~~at the point~~ *~~a~~* ~~where the function rule splits~~ | First, be sure that the function is continuous at . Take the derivative of each piece and show that |
| 18. Show that Rolle’s Theorem holds on | Show that *f* is continuous and differentiable on the interval. If , then find some *c* in  such that |
| 19. Show that Mean Value Theorem holds on | Show that *f* is continuous and differentiable on the interval. Then find some *c* such that |
| 20. Find  by definition |  |
| ~~21. Find derivative of inverse to at~~ | Interchange *x* with *y.* Solve forimplicitly (in terms of *y*). Plug your *x* value into the inverse relation and solve for *y*. Finally, plug that *y* into your *.* |
| 22. The rate of change of population is … |  |
| 23. The line  is tangent to  at | Two relationships are true. The two functions share the same slope () and share the same *y* value at . |
| 24. Find where the tangent line to  is horizontal | Write  as a fraction. Set the numerator equal to zero. |
| 25. Find where the tangent line to  is vertical | Write  as a fraction. Set the denominator equal to zero. |
| 26. Approximate the value of  by using the  tangent line to *f* at | Find the equation of the tangent line to *f* using  where  and the point is . Then plug in 0.1 into this line being sure to use an approximate sign. |
| 27. Find the derivative of |  |
| 28. Given a picture of , find where  is  increasing | Make a sign chart of  and determine where  is positive. |