

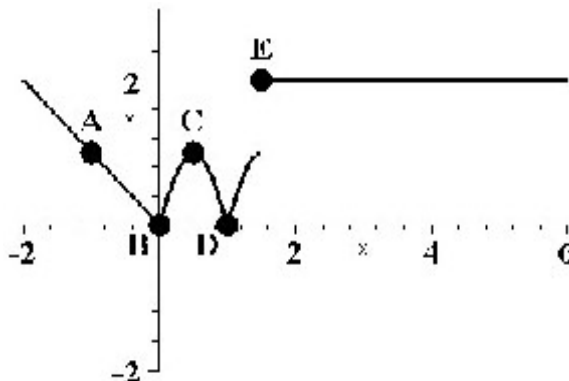
Midterm Study Guide

Basic Skills:(50%) Find the indicated derivative using short cuts, do not simplify.

1. Basic Derivative (Power, Sum/Difference, Constant Multiple, & Constant Rule)
2. Basic Derivative (Power, Sum/Difference, Constant Multiple, & Constant Rule)
3. Complicated Derivative (Power, Sum/Difference, Constant Multiple, & Constant Rule)
4. Product Rule
5. Quotient Rule
6. General Power Rule
7. General Power Rule/Product Rule Combo
8. Chain Rule
9. Chain Rule/Product Rule Combo
10. Chain Rule/Product Rule Combo
11. Chain Rule/Quotient Rule Combo
12. Chain Rule in Chain Rule Combo
13. Find the slope at of a parametric equation at a particular point
14. Implicit Derivative
15. Logarithmic Differentiation

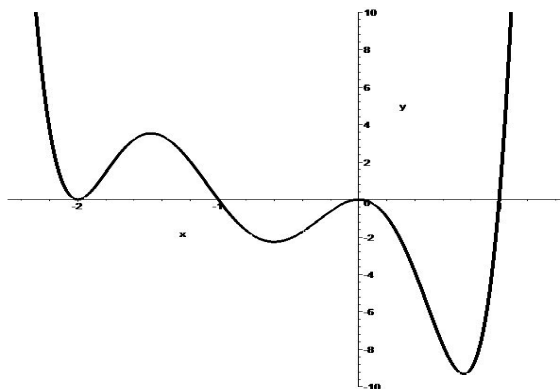
Theory & Knowledge:(50%)

1. The Derivative is the *Slope of the Tangent Line* and the *Instantaneous Rate of Change*.
2. Definition of the Limit.
3. Definition of Continuous.
4. Definition of Differentiable.
5. Given $f(x)$, a , L , and ϵ find δ so that if $|x - a| < \delta$ then $|f(x) - L| < \epsilon$.
6. Given a graph such as



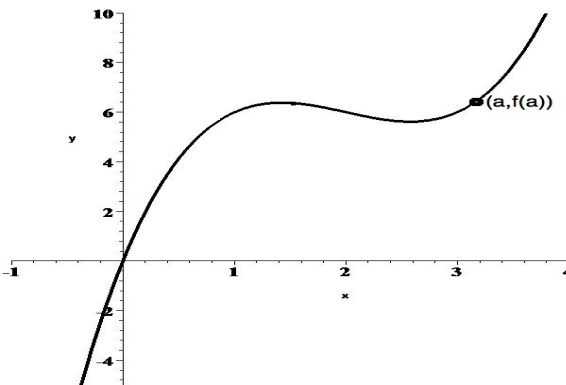
identify where the function is continuous, differentiable, both, or neither.

7. Given a graph of a function such as



sketch a possible graph of the derivative function.

8. Given the following graph



explain in terms of limits, secants, and tangents what the derivative is and how it is found. Add appropriate lines and points to the graph to help illustrate your explanation.

9. Given a function $f(x)$ using limits find the derivative and find the equation of the tangent line.