Name: _____   Grade: _____
Group Members Present:

_____ , _____ , & _____

1. For each labeled point on the figure...
    a. identify the instantaneous rate of change at the point as *positive*, *negative*, or *zero*.
    b. identify the concavity of the graph over a small interval around the point as *concave up*
        or *concave down*, or identify the point as an *inflection point*.
    c. Draw the line tangent to the graph at the point.
   d. Calculate the slope at the point.
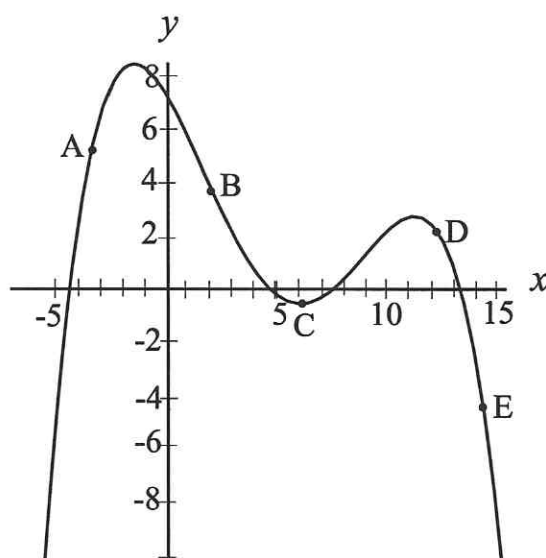
Point	Direction ↗, ↘, or const.	Concavity ccu, ccd, or infl.	Slope (show calculations)
A			
B			
C			
D			
E			

5e Calculus Concepts
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Learning Activity
2.2
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Drawing Tangent
Lines

2. The figure shows the total credit card volume for Visa, MasterCard, American Express, and Discover.

   a. The average rate of change in the total credit card volume between 1990 and 2005 can be estimated by drawing a _____ line between the points for $x =$ _____ and $x =$ _____ and calculating the _____ of that line. (Draw the line described.)

   b. What is the average rate of change in the total credit card volume between 1990 and 2005?

Credit Card Volume (Billion dollars)

years since 1988
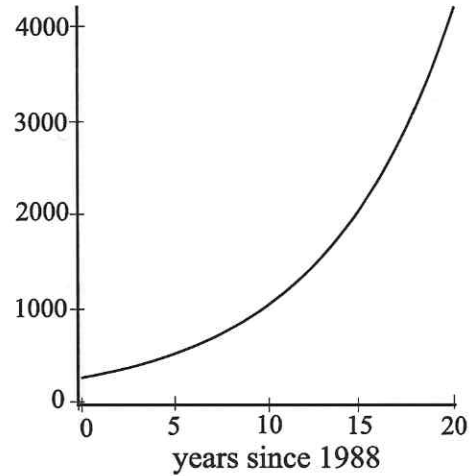
   c. The instantaneous rate of change in the total credit card volume in 2004 can be estimated by drawing a _____ line at the point for $x =$ _____ and calculating the _____ of that line. (Draw the line described.)

   d. What is the instantaneous rate of change in the total credit card volume at the end of 2004?

   e. Interpret the answers to parts *b* and *d*.