AP Calculus Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Pd.\_\_\_\_\_\_

Day 9 Approximating Derivatives or Avg. Rate of Change

1. Use the given table to approximate the expressions below.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |

|  |  |  |
| --- | --- | --- |
| a.)  | b.)  | c.)  |
| d.)  | e.)  | f.)  |

2. Explain why the expression in #1 may be undefined although numeric values were obtained by approximation. Provide as many reasons as you can.

3. Use the given graph to evaluate or approximate (whichever is appropriate) each expression. Be sure to indicate approximate answers with the  symbol.

|  |
| --- |
| a.)  |
| b.)  |
| c.)  |
| d.)  |
| e.)  |
| f.)  |
| g.)  |

4. The number of locations of a popular coffeehouse chain is given in the table. (The numbers of locations as of October 1 are given.)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | 2004 | 2005 | 2006 | 2007 | 2008 |
|  | 8569 | 10,241 | 12,440 | 15,011 | 16,680 |

1. Find the average rate of growth

|  |  |  |
| --- | --- | --- |
| From 2006 to 2008Or N’(2007) | From 2006 to 2007 | From 2005 to 2006 |

1. Estimate the instantaneous rate of growth in 2006. What are its units.
2. Estimate the instantaneous rate of growth in 2007 and compare it with the growth rate in 2006. What do you conclude?

5. The cost of producing x ounces of gold from a new gold mine is C=f(x) dollars.

a.) What is the meaning of the derivative f’(x)? What are its units?

b.) What does the statement f’(800)=17 mean?

c.) Do you think the values of f’(x) will increase or decrease in the short term? What about the long term? Explain.

6. The quantity (in pounds) of a gourmet ground coffee that is sold by a coffee company at a price of p dollars per pound is Q=f(p).

a.) What is the meaning of the derivative f’(8)? What are its units?

b.) Is f’(8) positive or negative? Explain

7. Let T(t) be the temperature (in $$) in Phoenix t hours after midnight on September 10, 2008. The table shows values of the function recorded every two hours. What is the meaning of T’(8)? Estimate its value.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| t | 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 |
| T | 82 | 75 | 74 | 75 | 84 | 90 | 93 | 94 |