1. (1 pt) Estimate $f'(4)$ for $f(x) = 4^x$. Be sure your answer is accurate to within 0.1 of the actual value.
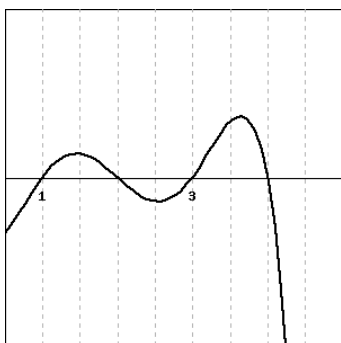
$f'(4) \approx$ ___

Be sure that you can explain your reasoning.
  Answer(s) submitted:

- •

(incorrect)

2. (2 pts) Consider the function $y = f(x)$ graphed below.

Give the x-coordinate of a point where:
A. the derivative of the function is positive: $x =$ ___
B. the value of the function is positive: $x =$ ___
C. the derivative of the function is largest: $x =$ ___
D. the derivative of the function is zero: $x =$ ___
E. the derivative of the function is approximately the same as the derivative at $x = 2.25$ (be sure that you give a point that is distinct from $x = 2.25$!): $x =$ ___
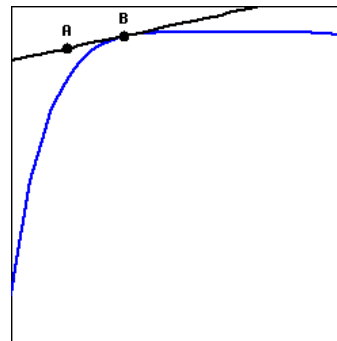 *Answer(s) submitted:*

- •
- •
- •
- •
- •

(incorrect)

3. (2 pts) The figure below shows a function $g(x)$ and its tangent line at the point $B = (4.4, 6.4)$. If the point A on the tangent line is $(4.38, 6.34)$, fill in the blanks below to complete the statements about the function g at the point B.

$g(\_\_) = \_\_$
$g'(\_\_) = \_\_$
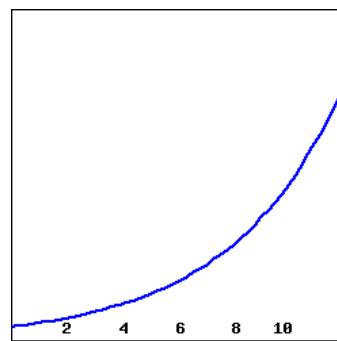 *Answer(s) submitted:*

- •
- •
- •
- •

(incorrect)

4. (2 pts) Consider the graph of the function $f(x)$ shown below.

Using this graph, for each of the following pairs of numbers decide which is larger. *Be sure that you can explain your answer.* .
  A. $f(6)$? $f(8)$
B. $f(6) - f(4)$? $f(4) - f(2)$
C. $\frac{f(4) - f(2)}{4 - 2}$? $\frac{f(6) - f(2)}{6 - 2}$
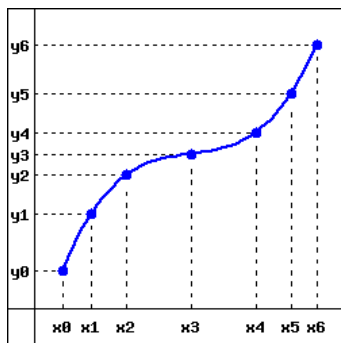**D.** $f'(2)$? $f'(8)$
  Answer(s) submitted:

- •
- •
- •
- •

(incorrect)

5. (2 pts) Consider the function shown in the figure below.

(a) Write an expression involving the values of x and $y = f(x)$ marked on the graph that gives the slope of the line joining the endpoints of the graph.

slope = _____

(b) On a print-out of this problem, draw the tangent line to the curve at the point $(x2, y2)$. How does the slope of this line compare with that of your line in (a)?

slope of this tangent line ⬚?⬚ slope of line from (a)

(c) Give another point on the curve where the slope of the line is approximately equal to the slope of your tangent line in (b).

$x =$ _____

Answer(s) submitted:

-
-
-

(incorrect)

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6. (1 pt) Use algebra to evaluate the limit $\lim\limits_{h \to 0} \frac{(4-h)^3 - 64}{h} =$

_____

Answer(s) submitted:

-

(incorrect)

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7. (1 pt) Find the derivative of $g(t) = 7t^2 + 8t$ at $t = 8$ algebraically.

$g'(8) =$ _____

Answer(s) submitted:

-

(incorrect)

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8. (1 pt) If $f(x) = 3x + 18$, find the instantaneous rate of change of $f(x)$ at $x = -5$

_____

Answer(s) submitted:

-

(incorrect)

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9. (2 pts)

Suppose that $f(x) = -6x^2 - 5x$.

(A) Find the slope of the line tangent to $f(x)$ at $x = -2$.

_____

(B) Find the instantaneous rate of change of $f(x)$ at $x = -2$.

_____

(C) Find the equation of the line tangent to $f(x)$ at $x = -2$.

$y =$ _____

Answer(s) submitted:

-
-
-

(incorrect)

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10. (1 pt) Suppose that $f(x)$ is a function with $f(115) = 31$ and $f'(115) = 2$. Estimate $f(118.5)$.

$f(118.5) =$ _____

Answer(s) submitted:

-

(incorrect)