Matthew Boelkins **MTH201-09**

Assignment 09.01.15.Intro due 09/04/2015 at 05:00pm EDT

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1. (1 pt) Find the equation of the line that passes through the (x,y) points $(0,4)$ and $(1,7)$.

$y =$_____

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2. (1 pt) Determine the slope and the y-intercept of the line $6x = 3y + 11$.

Slope= _____

y-intercept= _____

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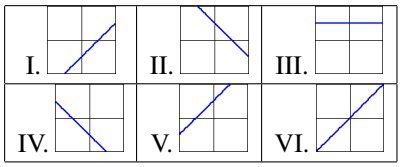
3. (1 pt) Match the graphs below with the equations following. (Note that the x and y scales may be unequal.)



(a) $5 = y$: ___	**(b)** $y = -4x - 5$: ___
(c) $y = x - 5$: ___	**(d)** $y = x/3$: ___
(e) $-2x + 4 = y$: ___	**(f)** $y = x + 6$: ___

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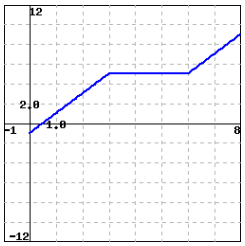
4. (1 pt)



The graph above illustrates your north-south distance in miles from the edge of a lake in hours from noon (where positive values mean you are north of the lake). When the graph passes through the axis, it means you pass by the edge of the lake (so your distance is 0). Complete the following description of your journey, selecting the correct descriptions of directions and filling in the numerical values for the indicated distances and speeds.

"At noon I am a distance of ___ miles from the lake relaxing. I then jump on my bike and start to cycle [?] the lake at a speed of ___ mph. At 3pm I stop for a rest and a picnic for three hours. I then jump back on my bike and cycle [?] the lake at a speed of ___ mph. At 8pm I arrive at my house which is a distance of ___ miles from the lake."

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5. (1 pt) The monthly charge for a waste collection service is 2030 dollars for 100 kg of waste and 3530 dollars for 175 kg of waste.

(a) Find a linear model for the cost, C, of waste collection as a function of the number of kilograms, w.

$C =$ _____

(b) What is the slope of the line found in part (a)?

Slope = _____

Think about the interpretation of the slope: are the units of the slope

- A. dollars
- B. dollars per kilogram
- C. kilograms
- D. kilograms per dollar

(c) What is the value of the vertical intercept of the line found in part (a)?

Value= _____

Think about the interpretation of the intercept: are the units of the intercept

- A. dollars
- B. dollars per kilogram
- C. kilograms
- D. kilograms per dollar

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6. (1 pt) Suppose that $f(t) = Q_0 a^t = Q_0(1+r)^t$ with $f(2) = 73.9$ and $f(10) = 180$. Find the following:

(a) $a =$ _____

(b) $r =$ _____

(Give both answers to at least 5 decimal places.)

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7. (1 pt) If you write the function $P = 9e^{2t}$ in the form $P = P_0 a^t$, then

$P_0 =$ ____, and

$a =$ ____.

This function represents exponential [?].

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8. (1 pt) For the function $f(x) = 3e^x$ and $g(x) = x^8$, find the following:

(a) $f(g(1))$= _____

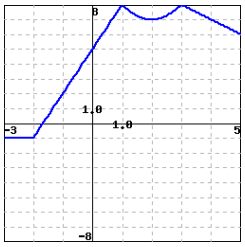
(b) $g(f(1))$= _____

(c) $f(g(x))$= _____

(d) $g(f(x))$= _____

(e) $f(t)g(t)$= _____

9. (1 pt)



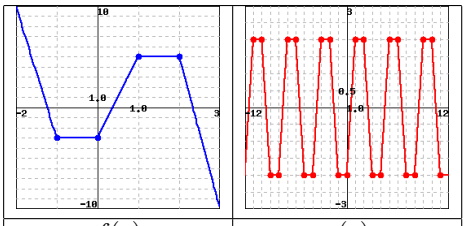
The figure above is the graph of the function $m(t)$. Let $n(t) = m(t) + 2$, $k(t) = m(t + 1.5)$,$w(t) = m(t - 0.5) - 2.5$ and $p(t) = m(t - 1)$. Find the values of the following:

1. $n(-2.5)$= _____.
2. $n(2)$= _____.
3. $k(1.5)$= _____.
4. $w(3.5)$= _____.
5. $w(0.5)$= _____.
6. $p(1.5)$= _____.

10. (1 pt) If $f(x) = x^2 + 9$, find and simplify the following:

(a) $f(t+7) =$ _____
(b) $f(t^5+7) =$ _____
(c) $f(5) =$ _____
(d) $5f(t) =$ _____
(e) $(f(t))^2 + 7 =$ _____

11. (1 pt)



$f(x)$ | $g(x)$

Use the figures above, which show the functions $f(x)$ and $g(x)$, to find the following values. Note that you can find exact values.

1. $f(g(-1))$=_____
2. $g(f(-1))$=_____
3. $g(g(7))$=_____