WeBWorK Assignment Homework03 is due : 05/21/2016 at 04:05pm EDT.

Reference: Axler, Precalculus, 2nd ed, Sections 2.1, 2.2, and 2.3

Here's the list of **functions and symbols** that WeBWorK understands.

1. (1 pt) Find an equation for the linear function which has f(50) = 1800 and f(700) = 4200f(x) =_____

2. (1 pt) Find an equation for the line passing through the point (4, 3) and perpendicular to the line y = 5x - 6.

3. (1 pt) Line *L* in the figure below is parallel to the line y = 4x + 2. Find the coordinates of the point *P*



(click on the graph to get a larger version)

 $P = _$

4. (1 pt) You bought a new car for \$27,500 in 2005, and the value of the car depreciates by \$500 each year. Find a formula for *V*, the value of the car, in terms of *t*, the number of years since 2005.

V(t) = -

(Be sure NOT TO USE ANY COMMAS when you enter your formula. For example enter two thousand as 2000 and not as 2,000.)

5. (1 pt) In a college meal plan you pay a membership fee, then all of your meals are at a fixed price per week. If 20 meals cost \$152 and 60 meals cost \$252, answer the following questions:

a) Write a formula for the cost of a meal plan, $C\,$, in terms of the number of meals, $n\,$.

C = -

- b) What is the membership fee? \$ _____
- c) What is the price per meal? \$ _____ per meal

d) Find the cost for 40 meals. \$ _____

e) Find *n* in terms of *C* . $n = _$

f) Finally, use your answer in part (e) to determine the maximum number of meals you can buy on a budget of \$300. Maximum number of meals implies if you find that n = 3.9, then you can buy a maximum of 3 meals. You must truncate any decimal solutions (which is different from rounding).

 $n = __$ meals

6. (1 pt) You want to choose one long distance telephone company from the following options:

Company A charges \$0.35 dollars per minute (no fixed monthly charge).

Company B charges \$14.05 per month plus \$0.18 per minute. Company C charges a fixed rate of \$50 per month.

Let A(x), B(x), and C(x) denote the monthly charges of Company A, B, and C respectively for spending x minutes on long distance calls.

(a) Find a formula for the monthly cost of using Company A, A(x):

$$A(x) = -$$

(b) Find a formula for the monthly cost of using Company B, B(x):

$$B(x) =$$

(c) Find a formula for the monthly cost of using Company C, C(x):

C(x) =_____

(d) If you spend 125 minutes talking long distance in a month, which of the three companies will be cheapest? Enter the letter (A, B, or C) here: ____

(e) Given the graph below, match the number of each graph to corresponding company it represents:



Company A	
Company B	
Company C	

7. (1 pt) Find the zero(s) (if any) of the function $y = x^2 - 5x - 50$

Enter your answer as a comma separated list. If no real zeros exist, enter **NONE**.

The zero(s) is/are x = _____

8. (1 pt) Find the vertex of the parabola $y = (x - 15)^2 + 8$ and determine whether it is a minimum or maximum .

The vertex is the point (_____, ____) and it is a (MIN or MAX) _____

9. (1 pt) The parabola given by the equation $y = -x^2 + 6x - 2$ has its vertex at (h,k) for:

h =_____

and

 $k = _$

10. (1 pt) A ball is tossed straight up from the edge of a 27 foot high building, with an initial upward velocity of 26\$ feet/second. Its height in feet after t seconds is

 $h(t) = -16t^2 + 26t + 27.$

Answer the following questions, including units in your answers.

How long before the ball hits the ground (h(t) = 0)?

How long before it reaches its maximum height?

How high will it go?

11. (1 pt) Consider the two points (5, -1) and (9, 6). The distance between them is:_____

The midpoint of the line segment that joins them is:_____

12. (1 pt) Find all x such that the distance between the points (-2, 4) and (x, -1) is 28. Note: If there is more that one x, give a comma separated list (i.e.: 1,2).

x=__

13. (1 pt) Find the point (0,b) on the y-axis that is equidistant from the points (2,2) and (3,-2).

14. (1 pt) Find an equation of the circle with center at the origin and passing through (3,4) in the form of

 $(x-A)^2 + (y-B)^2 = C$

where A, B, C are constants. Then

- $A = ___$ $B = ___$
- C =

15. (1 pt) The equation

$$(x-2)^2 + (y+5)^2 = 9$$

defines a circle with center $(__,__)$ and radius $__$. Hint: This equation is already in the form of the general equation of a circle.

16. (1 pt) $x^2 + y^2 + 18x - 10y - 63 = 0$ is the equation of a circle with center (h,k) and radius *r* for:

 $h = ___$ and $k = ___$ and $r = ___$

17. (1 pt) (a) Find the equation of the circle whose diameter has endpoints (-2, -4) and (4, -8). Write it in the form

$$(x-h)^2 + (y-k)^2 = r^2$$

and identify h, k, and r.

 $\begin{array}{rcl} h & = & & \\ k & = & & \\ r & = & & \\ \end{array}$

(b) Find the equation of the circle that has center (-1, -2) and is tangent to the *y*-axis. Write it in the form

$$(x-h)^2 + (y-k)^2 = r^2$$

and identify *h*, *k*, and *r*.

 $\begin{array}{rcl} h & = & & \\ k & = & & \\ r & = & & \\ \end{array}$

18. (1 pt) The equation

$$\frac{(x-2)^2}{9} + \frac{(y-4)^2}{25} = 1$$

defines an ellipse with center (_____, ____). The major axis has length _____ and the minor axis has length _____. Hint: This equation is in standard form.

19. (1 pt) The equation

$$9x^2 - 18x + 4y^2 + 8y = 23$$

defines an ellipse with center (_____, ____). The major axis has length _____ and the minor axis has length _____. Hint: Convert the equation to standard form.

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20. (1 pt) Write equations for each ellipse (If you have a hard time seeing the picture clearly, click on the picture so that you can inspect it more closely.)



$$\frac{(y-A)^2}{B^2} + \frac{(x-C)^2}{D^2} = 1$$

where A =____ where B =____ where C =____ where D =____



$$\frac{(y-A)^2}{B^2} + \frac{(x-C)^2}{D^2} = 1$$

where A =____ where B =____ where C =____ where D =____

21. (1 pt) Consider the hyperbola $49y^2 - 49x^2 = 49$. Its vertices are $(0, \pm A)$ with A =____; its foci are $(0, \pm B)$ with B =___; its asymptotes are $y = \pm Cx$ with C =___.

22. (1 pt) Evaluate the following expression without using a calculator. Simplify your answer as much as possible, and enter your answer as a fraction.

$$\left(\frac{64}{8}\right)^{-1/3} =$$

23. (1 pt) Simplify the following expression as much as possible. Assume that all variables are positive.

$$\sqrt[4]{64x^5}\sqrt[4]{64x^{11}} =$$

24. (1 pt) The expression

$$\left(\frac{x^6y}{y^4}\right)^{4/5}$$

equals x^r/y^t where r, the exponent of x, is: ______ t, the exponent of y, is: ______

25. (1 pt) Change the radical

$$\sqrt{\frac{5}{8}}$$

into simplest radical form $\frac{A}{B}\sqrt{C}$, where *A*, *B*, and *C* are all integers.

Answer: A =_____, B =_____, and C =_____

26. (1 pt) Find the product

$$(2\sqrt{x}-6\sqrt{y})(2\sqrt{x}+6\sqrt{y})$$

and express your answer in simplest radical form.

Answer: ____

27. (1 pt) The solution of the equation $\sqrt{2x+1} = \sqrt{2x-1} + 1$ is x =___.

28. (1 pt) The solution of the equation

$$(2x-1)^{\frac{1}{3}} - 3 = 0$$

is x =____.

Hint: You need to take something to the power 3.

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