Math Problem Set 3

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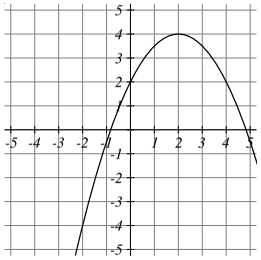
#1 Points possible: 1. Total attempts: 2

Write an equation (any form) for the quadratic graphed below



y = _____

~~$-.5 \cdot (x-2)^2 + 4$~~ -0.5 (x - 2)^2 + 4

#2 Points possible: 1. Total attempts: 2

Consider the parabola given by the equation: $f(x) = 4x^2 - 12x - 1$

Find the following for this parabola:

A) The vertex: _____

B) The vertical intercept is the point _____

C) Find the coordinates of the two x intercepts of the parabola and write them as a list, separated by commas:

_____

It is OK to round your value(s) to to two decimal places.

$\left(\frac{3}{2}, -10\right)$

$(0, -1)$

$(3.08, 0), (-0.08, 0)$

#3 Points possible: 1. Total attempts: 2

Put the equation $y = x^2 + 20x + 96$ into the vertex form $y = (x-h)^2 + k$:

Answer: $y =$ _____

$(x + 10)^2 - 4$

#4 Points possible: 1. Total attempts: 2

Find b and c so that $y = 17x^2 + bx + c$ has vertex $(-10, 5)$.

$b =$ _____ .

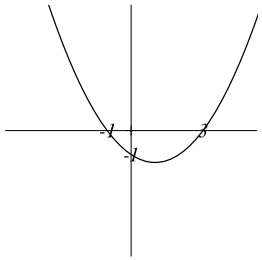
$c =$ _____ .

340

1705

#5 Points possible: 1. Total attempts: 2

Write an equation for the quadratic graphed below
x-intercepts: (-1,0) and (3,0). y-intercept: (0,-1)



y = _____

$\frac{1}{3} \cdot (x+1)(x-3)$

#6 Points possible: 1. Total attempts: 2

Which of the following equations are equivalent to $ax^2 + bx + c = 0$?

- ☐ $\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$
- ☐ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
- ☐ $x^2 + bx = -c$
- ☐ $x = -b \pm \frac{\sqrt{b^2 - 4ac}}{2a}$
- ☐ $\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{2a}$
- ☐ $x^2 + \frac{b}{a}x + \frac{c}{a} = 0$
- ☐ $ax^2 + bx = -c$

$x^2 + \frac{b}{a}x + \frac{c}{a} = 0$
$ax^2 + bx = -c$
$\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

#7 Points possible: 1. Total attempts: 2

A person's systolic blood pressure, which is measured in millimeters of mercury (mm Hg), depends on a person's age, in years. The equation:

$P = 0.006y^2 - 0.02y + 118$

gives a person's blood pressure, P, at age y years.

A.) Find the systolic pressure, to the nearest tenth of a millimeter, for a person of age 46 years.

_____

B.) If a person's systolic pressure is 128.23 mm Hg, what is their age (rounded to the nearest single year)?

_____

129.8
43

#8 Points possible: 1. Total attempts: 2

This question is not about solving the stated problem, but about understanding it.

A rocket is launched, and its height above sea level t seconds after launch is given by the equation $h(t) = -4.9t^2 + 1000t + 470$.

a) From what height was the rocket launched?

To answer this question, we'd find: Select an answer

b) What is the maximum height the rocket reaches?

To answer this question, we'd find: Select an answer

c) If the rocket will splash down in the ocean, when will it splash down?

To answer this question, we'd find: Select an answer
The h intercept
The h coordinate of the vertex
The t intercept

#9 Points possible: 1. Total attempts: 2

NASA launches a rocket at $t = 0$ seconds. Its height, in meters above sea-level, as a function of time is given by $h(t) = -4.9t^2 + 52t + 367$.

Assuming that the rocket will splash down into the ocean, at what time does splashdown occur?

The rocket splashes down after _____ seconds.

How high above sea-level does the rocket get at its peak?

The rocket peaks at _____ meters above sea-level.
15.46
504.96

#10 Points possible: 1. Total attempts: 2

The height y (in feet) of a ball thrown by a child is
$y = -\frac{1}{12}x^2 + 6x + 3$
where x is the horizontal distance in feet from the point at which the ball is thrown.

(a) How high is the ball when it leaves the child's hand? _____ feet

(b) What is the maximum height of the ball? _____ feet

(c) How far from the child does the ball strike the ground? _____ feet
3
111
72.5

#11 Points possible: 1. Total attempts: 2

A coffee shop currently sells 440 lattes a day at $2.75 each. They recently tried raising the by price by $0.25 a latte, and found that they sold 30 less lattes a day.

a) Assume that the number of lattes they sell in a day, N, is linearly related to the sale price, p (in dollars). Find an equation for N as a function of p.

$N(p) =$ _____

b) Revenue (the amount of money the store brings in before costs) can be found by multiplying the cost per cup times the number of cups sold. Again using p as the sales price, use your equation from above to write an equation for the revenue, R as a function of p.

$R(p) =$ _____

c) The store wants to maximize their revenue (make as much money as possible). Find the value of p that will maximize the revenue (round to the nearest cent).

$p =$ _____
which will give a maximum revenue of $ _____
$-120p + 770$
$-120p^2 + 770p$
3.21
1235.21

#12 Points possible: 1. Total attempts: 2

A rectangle is drawn so that the width is 3 feet shorter than the length. The area of the rectangle is 4 square feet. Find the length of the rectangle.

_____ feet
4

#13 Points possible: 1. Total attempts: 2

A box with a square base and no top is to be made from a square piece of carboard by cutting 2 in. squares from each corner and folding up the sides. The box is to hold 3042 in^3. How big a piece of cardboard is needed?

Your answer is: _____ in. by _____ in.
43
43

#14 Points possible: 1. Total attempts: 2

A rectangle is drawn so the width is 16 inches longer than the height. If the rectangle's diagonal measurement is 80 inches, find the height.

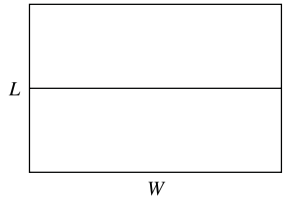
Give your answer rounded to 1 decimal place.

_____ inches

48

#15 Points possible: 1. Total attempts: 2

A rancher wants to fence in an area of 10,000 square feet in a rectangular field and then divide it in half with a fence down the middle parallel to one side, as shown below.



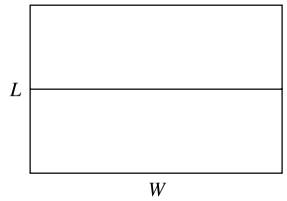
Write an equation for the total length of fence required in terms of the the width, W.

fence required = _____ feet

$2 \cdot \frac{10000}{W} + 3 \cdot W$

#16 Points possible: 1. Total attempts: 2

A farmer wishes to build two side-by-side pens fencing a rectangular area with sides of length L and width W, and splitting it down the middle with fencing parallel to the side W. The figure below is not to scale. If the farmer has 660 total feet of fencing to work with, what dimensions will maximize the area enclosed?



Your answer is: L= _____ ft. by W = _____ ft.

165

110

#17 Points possible: 1. Total attempts: 2

A rancher wants to fence in an area of 1500000 square feet in a rectangular field and then divide it in half with a fence down the middle parallel to one side. What is the shortest length of fence that the rancher can use?

_____

6000

#18 Points possible: 1. Total attempts: 2

Alicia drives to the beach, which is 70 miles away. One the way back, due to road construction she had to drive 9 mph slower, thus the return trip took 2 hours longer. Which of the following equations would be used to find the rate at which Alicia drove to the beach? Pick two.

- ☐ $(v + 9)(t - 2) = 70$
- ☐ $vt = 70$
- ☐ $vt = (2)(70)$
- ☐ $(v - 9)(t + 2) = 70$
- ☐ $(v + 9)(t + 2) = 70$
- ☐ $(v - 9)(t - 2) = 70$

$vt = 70$
$(v - 9)(t + 2) = 70$

#19 Points possible: 1. Total attempts: 2

Trey went on a bike ride. After 18 miles he got a flat tire and had to jog back home. He jogs 9 mph slower than he bikes, so the jog took 1 hour longer than the bike ride. At what rate did he travel each way?

On the bike, Trey went _____ mph

Jogging back he went _____ mph
18
9

#20 Points possible: 1. Total attempts: 2

Alicia can do a job in 12 hours less than Erik can. If they work together they can get the job done in 8 hours. How long would it take each to do the job alone?

Alicia can do the job in _____ hours

Erik can do the job in _____ hours
12
24
