

m4 Quiz Review

Tuesday, April 14, 2015

1. Multiply the binomials

$$2x^2 + 14x - 3x + 21$$

$$\boxed{2x^2 + 11x - 21}$$

	$2x + -3$
x	$2x^2 - 3x$
$+$	
7	$14x - 21$

2. Factor completely

$$3x^2 - 15x + 18$$

$$3 \cdot (x^2 - 5x + 6)$$

$$\boxed{3(x-3)(x-2)}$$

$$a=1$$

$$b=-5$$

$$c=6$$

	6	-2
-3	1	-5
	6	-2

	$x-3$
x	$x^2 - 3x$
-2	$-2x + 6$

3. The perimeter of a rectangle is 30 inches. The length of the rectangle is three inches less than twice the width. What are the dimensions of the rectangle?

$$\boxed{P = 30 \text{ in } w}$$

$$l = 2w - 3$$

$$\text{length} = 2(6) - 3$$

$$= 12 - 3$$

check

$$9 + 9 + 6 + 6$$

$$18 + 12 = 30 \checkmark$$

$$2(2w - 3) + 2(w) = 30$$

$$4w - 6 + 2w = 30$$

$$6w - 6 = 30$$

$$+6 \quad +6$$

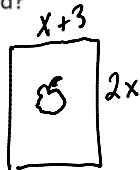
$$\boxed{w = 6}$$

$$6w = 36$$

$$\boxed{\text{length} = 9 \text{ in}}$$

$$\boxed{\text{width} = 6 \text{ in}}$$

4. Mr. Marcus has an iPad mini. In inches, the length is twice a number and the width is three more than that same number. The area of the iPad is 56 in^2 . What is the unknown number? What are the dimensions of the iPad?



$$l = 2x$$

$$w = x + 3$$

$$A = 56 \text{ in}^2$$

$$A = l \cdot w$$

$$56 = (2x)(x+3)$$

$$56 = 2x^2 + 6x$$

$$0 = 2x^2 + 6x - 56$$

$$0 = 2(x^2 + 3x - 28)$$

$$0 = 2(x+7)(x-4)$$

$$\cancel{x = -7} \quad \boxed{x = 4}$$

$$a=1$$

$$b=3$$

$$c=-28$$

	-28
$+7$	-4
	3

$$\boxed{x = 4}$$

$$\boxed{\text{length} = 8 \text{ in}}$$

$$\boxed{\text{width} = 7 \text{ in}}$$

5. Graph the quadratic function and identify the key characteristics

$$y = x^2 + 3x - 18$$

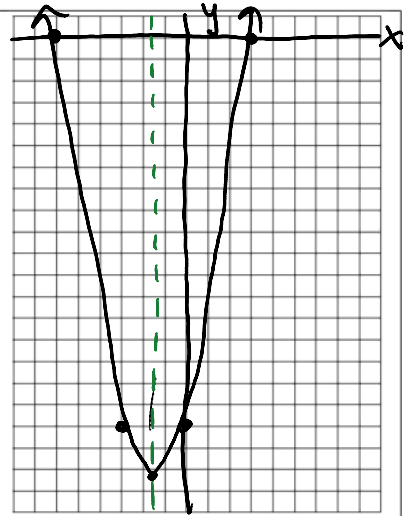
1) x-intercepts: $y = 0$
 $0 = x^2 + 3x - 18$
 $0 = (x+6)(x-3)$
 $x = -6$ and $x = 3$
 $(-6, 0)$ and $(3, 0)$

3) y-intercept: $x = 0$
 $y = (0)^2 + 3(0) - 18$
 $y = -18$
 $(0, -18)$

2) Vertex: $(-1.5, -20.25)$

a) axis of symmetry $x = \frac{-b}{2a} \rightarrow x = \frac{-3}{2(1)} = -\frac{3}{2} = -1.5$

b) $y = (-1.5)^2 + 3(-1.5) - 18$
 $y = 2.25 + -4.5 - 18$
 $y = -20.25$



6. Peggy Sue tosses a coin off a bridge. The coin's vertical distance (in feet) from the water can be represented by the equation $h(t) = -16t^2 + 96t + 112$ where t is the amount of time (in seconds) that the coin has been in the air.

- a. Sketch a graph of the problem situation

x-intercepts

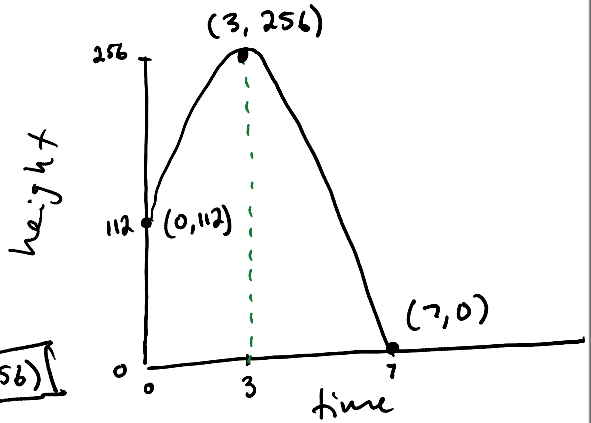
$$0 = -16t^2 + 96t + 112$$

$$0 = -16(t^2 - 6t - 7)$$

$$0 = -16(t+1)(t-7)$$

$t = -1$ $t = 7$

vertex axis of symmetry: $x = \frac{-96}{2(-16)} \rightarrow x = 3$ vertex $(3, 256)$



- b. How long does it take the coin to reach its maximum height?
 The coin reaches its max. height at 3 seconds.

c. How high does Peggy Sue toss the coin?
 $h(3) = -16(3)^2 + 96(3) + 112$
 $h(3) = -144 + 288 + 112$
 $h(3) = 256$

Peggy Sue tosses the coin 256 ft into the air

- d. How long does it take the coin to reach the water?
 It takes 7 seconds for the coin to reach the water.

e. How tall is the bridge from which the coin was tossed? $t = 0$
 $h(0) = -16(0)^2 + 96(0) + 112$
 $h(0) = 112$
 The bridge is 112 feet tall

