Algebra 1 Bellwork Tuesday, April 21, 2015

1. Find the equation for the Line of Symmetry for each parabola.

a) $y = 4x^2 + 10x - 7$ b) $y = -3x^2 + 6$ c) $y = -2x^2 - 12x$

2. Find the coordinates for the vertex of each parabola.

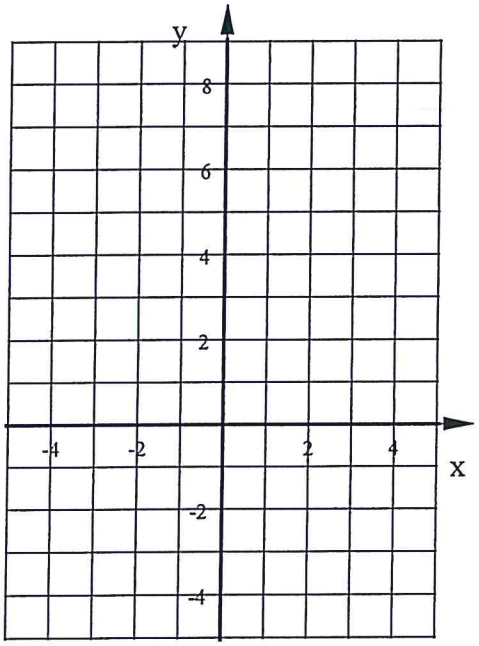
a) $y = 6x^2 - 11$ b) $y = 4x^2 + 10x - 3$ c) $y = -x^2 - 8x$

3. Find the y-intercept for each parabola.

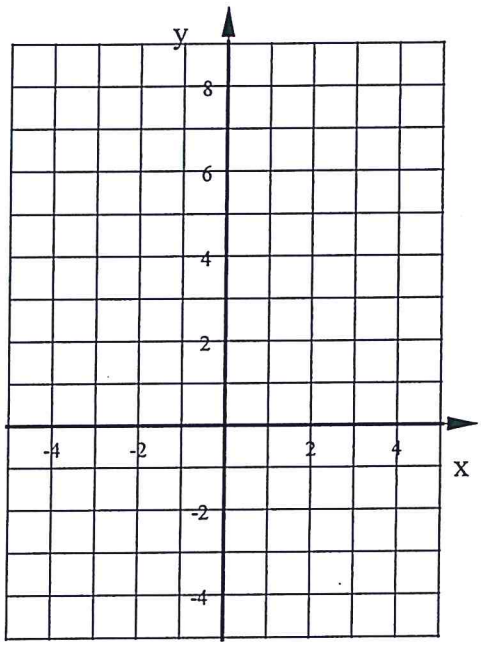
a) $y = 9x^2 + 3x - 8$ b) $y = 5x^2 + 1$ c) $y = -2x^2 + 12x$

4. Graph each parabola using at least five points.

a) $y = 3x^2 - 12x + 8$



b) $y = -2x^2 - 12x - 12$



5. An object is shot into the air from the roof of a 50 foot tall building. The following function models the height of the object as a function of time: $h(t) = -16t^2 + 144t + 50$

a) Find the time it takes the object to reach its maximum height.

b) Find the maximum height of the object.

6. A company makes parts for automobiles. The company wants to maximize its income. Their income is a function of the number of hours each week the factory is in operation. The following equation models the company's income as a function of the number of hours each week the factory is operating: $I(h) = -6h^2 + 768h + 2450$

a) Find the number of hours the factory should be operating in order to maximize their income.

b) Find the maximum income.

Algebra 1 Bellwork Tuesday, April 21, 2015 ANSWERS

1. Find the equation for the Line of Symmetry for each parabola.

a) $y = 4x^2 + 10x - 7$ LOS: $x = \frac{-10}{2(4)} = -1.25$

b) $y = -3x^2 + 6$ LOS: $x = \frac{0}{2(-3)} = 0$

c) $y = -2x^2 - 12x$ LOS: $x = \frac{12}{2(-2)} = -3$

2. Find the coordinates for the vertex of each parabola.

a) $y = 6x^2 - 11$ LOS $x = \frac{0}{2(6)} = 0$ $(0, -11)$

b) $y = 4x^2 + 10x - 3$ LOS $x = \frac{-10}{2(4)} = -1.25$ $(-1.25, -9.25)$

c) $y = -x^2 - 8x$ $(-4, 16)$ LOS $x = \frac{8}{2(-1)} = -4$

3. Find the y-intercept for each parabola.

a) $y = 9x^2 + 3x - 8$ y-int $= -8$

b) $y = 5x^2 + 1$ y-int $= 1$

c) $y = -2x^2 + 12x$ y-int $= 0$

4. Graph each parabola using at least five points.

a) $y = 3x^2 - 12x + 8$

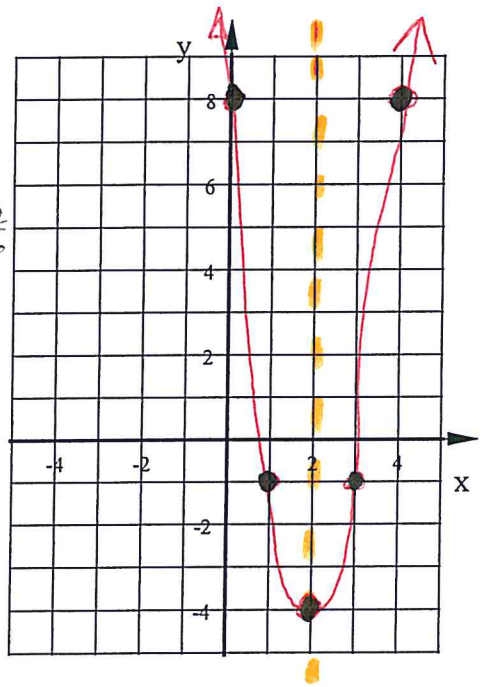
y-int $= 8$

LOS: $x = \frac{12}{2(3)} = \frac{12}{6}$

$x = 2$

Vertex $(2, -4)$

x	y
1	-1



b) $y = -2x^2 - 12x - 12$

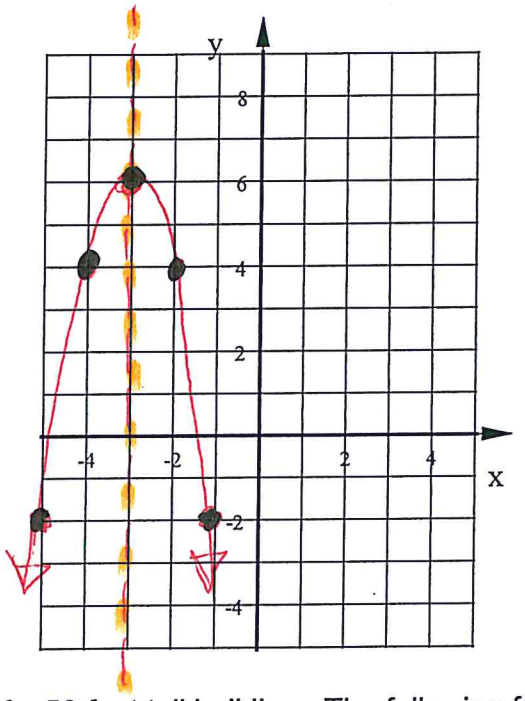
y-int $= -12$

LOS $x = \frac{12}{2(-2)} = \frac{12}{-4}$

$x = -3$

Vertex $(-3, 6)$

x	y
-2	4
-1	-2



5. An object is shot into the air from the roof of a 50 foot tall building. The following function models the height of the object as a function of time: $h(t) = -16t^2 + 144t + 50$

(t, h) max

a) Find the time it takes the object to reach its maximum height.

x-coord of vertex: LOS $\rightarrow t = \frac{-144}{2(-16)} = 4.5$ sec

b) Find the maximum height of the object.

y-coord of vertex: max ht $h(4.5) = 374$ ft

6. A company makes parts for automobiles. The company wants to maximize its income. Their income is a function of the number of hours each week the factory is in operation. The following equation models the company's income as a function of the number of hours each week the factory is operating:

$I(h) = -6h^2 + 768h + 2450$

(h, I) max

a) Find the number of hours the factory should be operating in order to maximize their income.

x-coord of vertex: LOS $\rightarrow h = \frac{-768}{2(-6)} = 64$ hrs/wk

b) Find the maximum income.

y-coord of vertex: $I(64) = \$27,026$