

SOLUTIONS...

Algebra 1

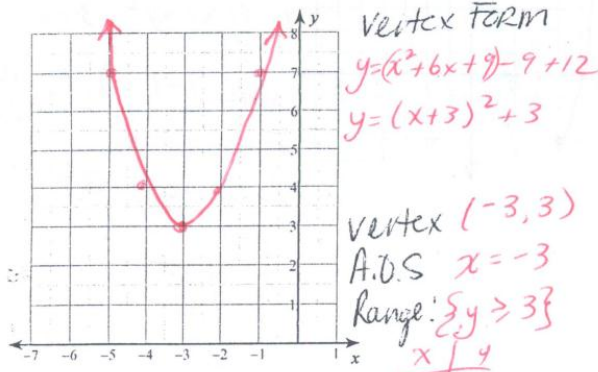
Name Key ID: 1

Assignment

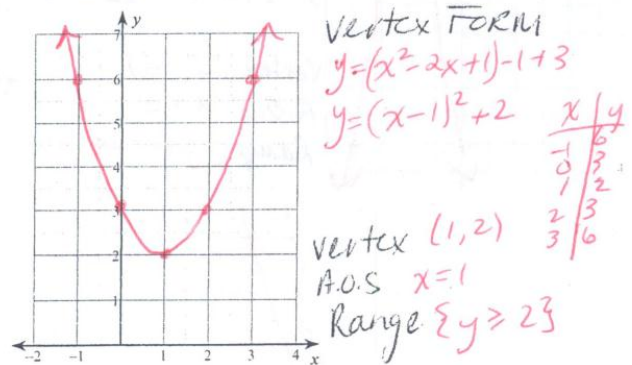
Date _____ Period _____

Sketch the graph of each function.

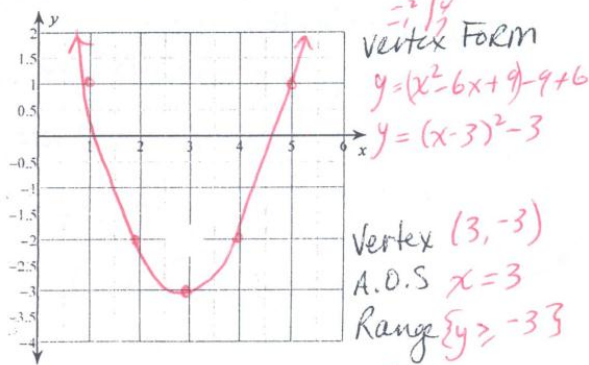
1) $y = x^2 + 6x + 12$



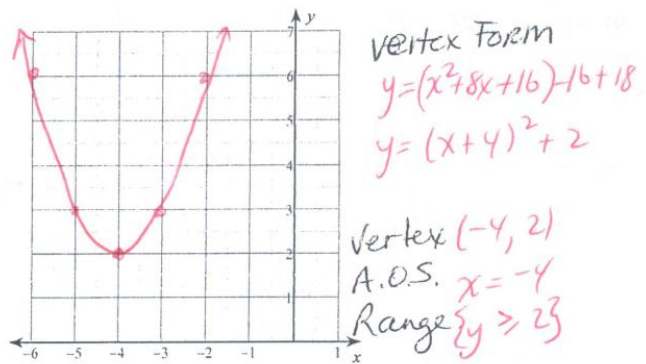
2) $y = x^2 - 2x + 3$



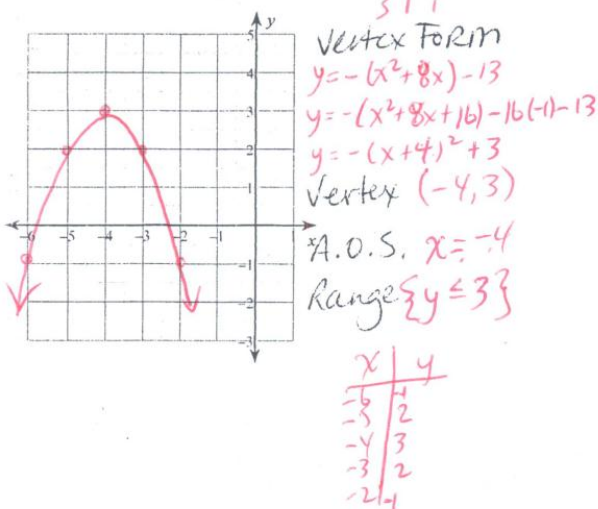
3) $y = x^2 - 6x + 6$



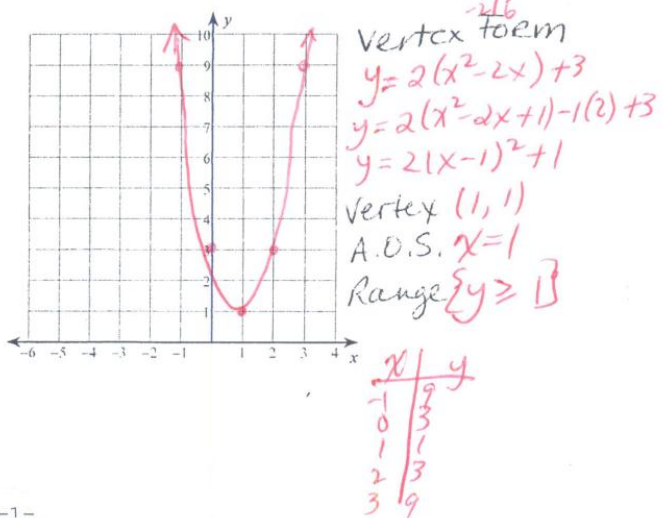
4) $y = x^2 + 8x + 18$



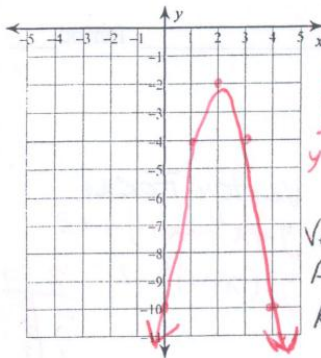
5) $y = -x^2 - 8x - 13$



6) $y = 2x^2 - 4x + 3$



7) $y = -2x^2 + 8x - 10$

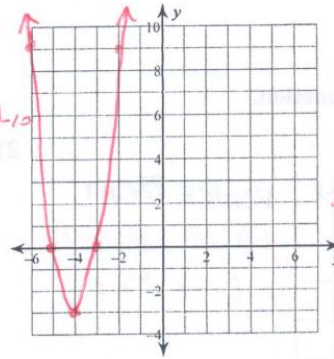


Vertex Form
 $y = -2(x^2 - 4x) - 10$
 $y = -2(x^2 - 4x + 4) - 4(-2) - 10$
 $y = -2(x - 2)^2 - 2$

Vertex $(2, -2)$
 A.O.S. $x = 2$
 Range $\{y \leq -2\}$

x	y
0	-10
1	-4
2	-2
3	-4
4	-10

8) $y = 3x^2 + 24x + 45$

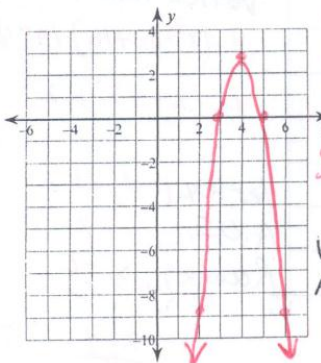


Vertex Form
 $y = 3(x^2 + 8x) + 45$
 $y = 3(x^2 + 8x + 16) - 16(3) + 45$
 $y = 3(x + 4)^2 - 3$

Vertex $(-4, -3)$
 A.O.S. $x = -4$
 Range $\{y \geq -3\}$

x	y
-6	9
-5	0
-4	-3
-3	0
-2	9

9) $y = -3x^2 + 24x - 45$

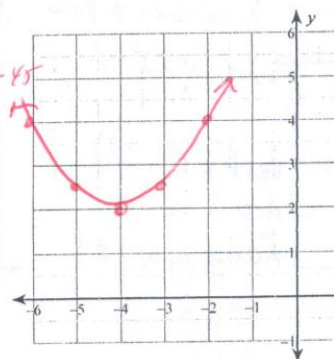


Vertex Form
 $y = -3(x^2 - 8x) - 45$
 $y = -3(x^2 - 8x + 16) - 16(-3) - 45$
 $y = -3(x - 4)^2 + 3$

Vertex $(4, 3)$
 A.O.S. $x = 4$
 Range $\{y \leq 3\}$

x	y
2	-9
3	0
4	3
5	0
6	-9

10) $y = \frac{1}{2}x^2 + 4x + 10$



Vertex Form
 $y = \frac{1}{2}(x^2 + 8x) + 10$
 $y = \frac{1}{2}(x^2 + 8x + 16) - 16(\frac{1}{2}) + 10$
 $y = \frac{1}{2}(x + 4)^2 + 2$

Vertex $(-4, 2)$
 A.O.S. $x = -4$
 Range $\{y \geq 2\}$

x	y
-6	4
-5	2.5
-4	2
-3	2.5
-2	4

(10)

$$y = \frac{1}{2}x^2 + 4x + 10$$

$$y = \frac{1}{2}(x^2 + 8x) + 10$$

$$y = \frac{1}{2}(x^2 + 8x + 16) - 16\left(\frac{1}{2}\right) + 10$$

$$y = \frac{1}{2}(x + 4)^2 - 8 + 10$$

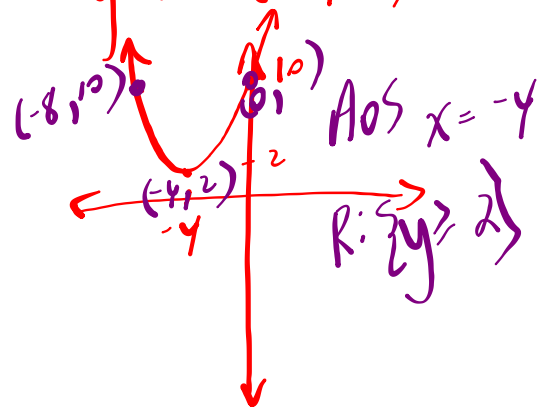
$$y = \frac{1}{2}(x + 4)^2 + 2$$

Standard y-int (0, 10)
 $a = \frac{1}{2}$

$$\begin{array}{r} 4 \div \frac{1}{2} \\ 4 \times 2 \\ \hline 8 \end{array}$$

Vertex (-4, 2)

y-int (0, 10)



$$48 \div \frac{2}{1} \Leftrightarrow 48 \times \frac{1}{2}$$

WARM-UP: Complete the chart given...

$$y = -3x^2 - 12x + 10$$

Vertex Form	$y = -3(x+2)^2 + 22$
Direction of Opening	Down
Stretch Factor $ a $	3
Vertex	$(-2, 22)$
y - intercept	$(0, 10)$
Domain	$x \in \mathbb{R}$
Range	$y \leq 22$
Max or Min y - value	MAX y value 22
Axis of Symmetry	$x = -2$
Sketch (label ALL key Points)	

$$y = -3(x^2 + 4x) + 10$$

$$y = -3(x^2 + 4x + 4) - 4(-3) + 10$$

$$y = (-3)(x+2)^2 + 22$$

In Class Exercise...

1. Complete the chart shown for the quadratic: $y = -5(x+3)^2 + 8$

Direction of Opening	Down
Vertex	$(-3, 8)$
y-intercept	$(0, -37)$
Domain	$\{x \in \mathbb{R}\}$
Range	$\{y \leq 8\}$
Equation for Axis of Symmetry	$x = -3$
Maximum OR Minimum	Max
Minimum /Maximum Value	8
<p>Sketch: Must have 3 key points labeled</p>	

$$y = -5(0+3)^2 + 8$$

$$y = -5(9) + 8$$

$$y = -45 + 8$$

$$y = -37$$

[10]

2. Change each of the following into vertex form...

[8]

a) $y = -2x^2 - 8x + 6$

$$y = -2(x^2 + 4x) + 6$$

$$y = -2(x^2 + 4x + 4) - 4(-2) + 6$$

$$y = -2(x + 2)^2 + 14$$

b) $y = 4x^2 + 12x - 5$

$$y = 4(x^2 + 3x) - 5$$

$$y = 4(x^2 + 3x + 2.25) - 2.25(4) - 5$$

$$y = 4(x + 1.5)^2 - 14$$

3. Change the following into standard form and state the given properties.

[7]

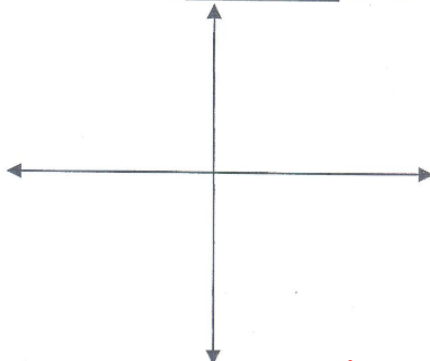
$$y = \frac{2}{3}(x+6)^2 - 23$$

$$y = \frac{2}{3}(x^2 + 12x + 36) - 23$$

$\frac{2}{3}(0+6)^2 - 23$	1
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$$y = \frac{2}{3}x^2 + 8x + 24 - 23$$

$$y = \frac{2}{3}x^2 + 8x + 1$$

Vertex	$(-6, -23)$
y-intercept	$(0, 1)$
Sketch: Must have <u>3 key points</u> labeled	
	

$$(x+6)(x+6)$$

$$x^2 + bx + bx + 3b$$

$$x^2 + 12x + 3b$$