Name:_____   Date:_____
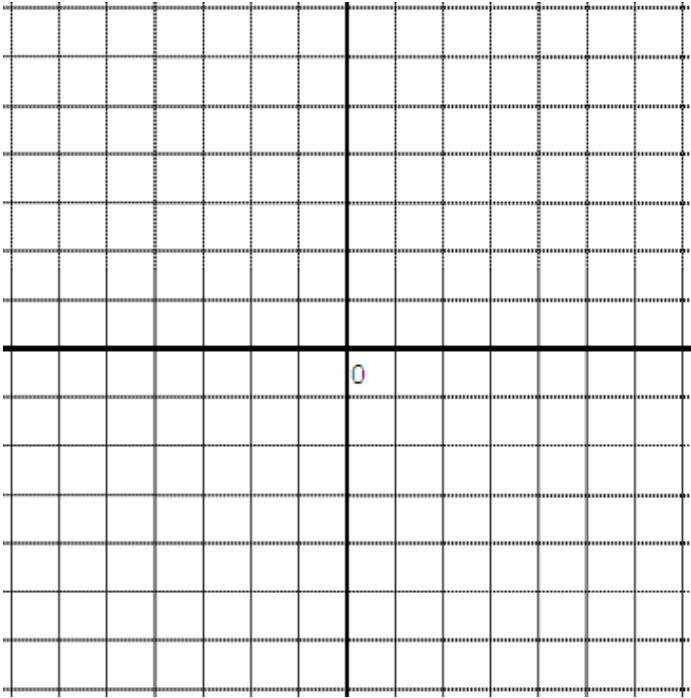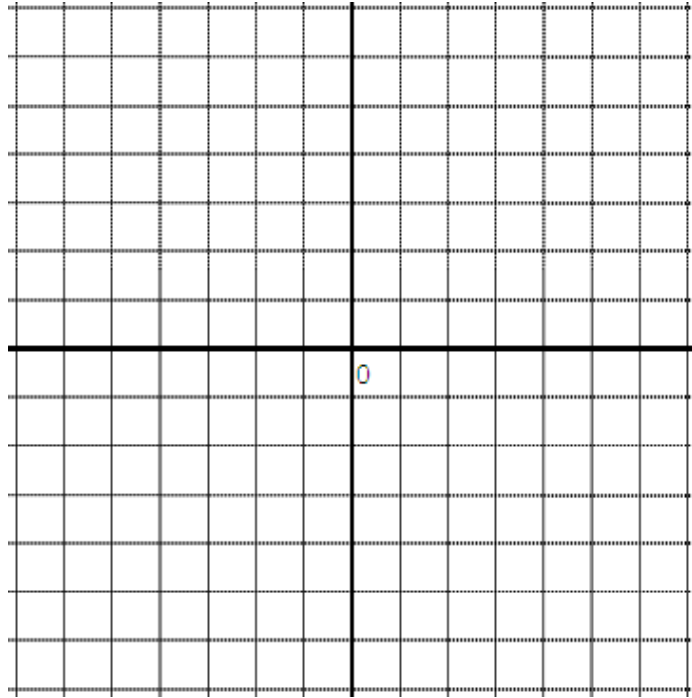
Pre-Calculus 11 HW 3.1 Quadratic Functions in Standard Form $y = a(x-p)^2 + q$

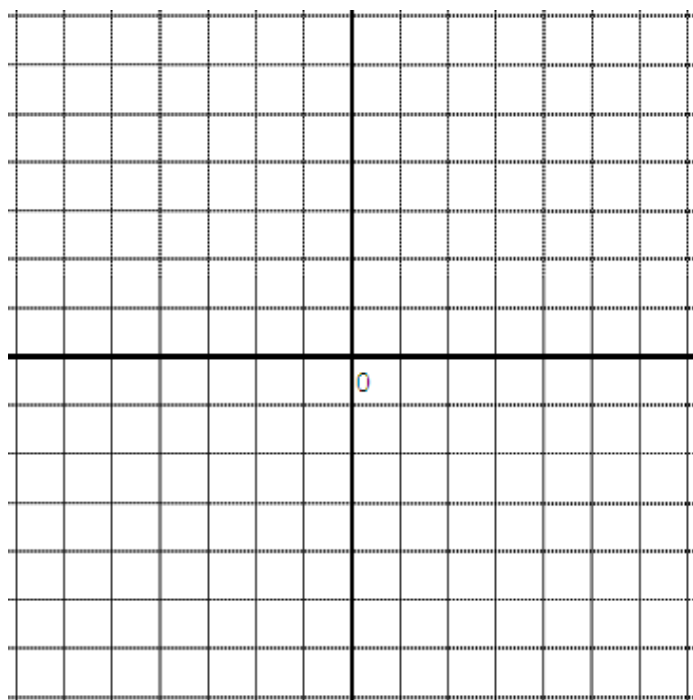1. Indicate the values of "a", "p", "q" and the coordinates of the vertex in each equation:

| a) $y = 3(x-4)^2 + 8$	b) $y = 2(x+6)^2 - 13$	c) $y = -4x^2 + 10$
$a =$ $p =$ $q =$ $Vertex:$	$a =$ $p =$ $q =$ $Vertex:$	$a =$ $p =$ $q =$ $Vertex:$
d) $y = 21 - (x-1)^2$	e) $y = 4(x-20)^2 + 11$	f) $y = (-3x)^2 + 2$
$a =$ $p =$ $q =$ $Vertex:$	$a =$ $p =$ $q =$ $Vertex:$	$a =$ $p =$ $q =$ $Vertex:$

2. Graph each of the following quadratic functions and label the following: Equation of the Axis of Symmetry, Coordinates of the Vertex, and location of the X and Y-intercepts. Do **NOT** use a graphing calculator:

a) Equation: $y = (x-4)^2 - 5$
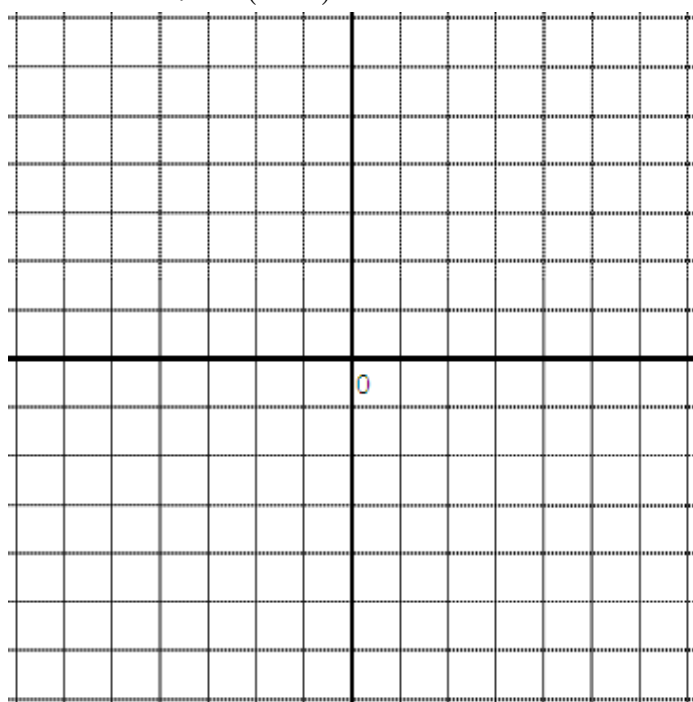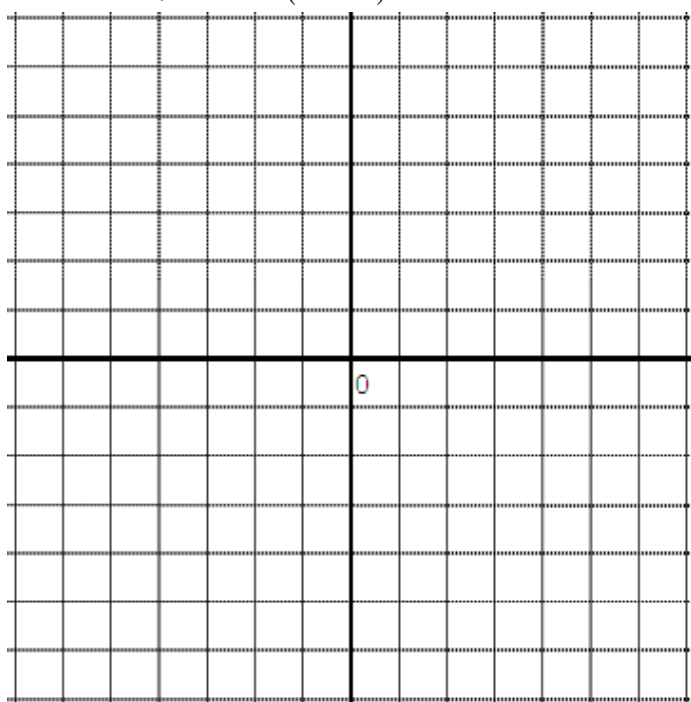

b) Equation: $y = -(x+3)^2 + 6$

c) Equation: $y = \dfrac{1}{3}(x+3)^2 + 1$
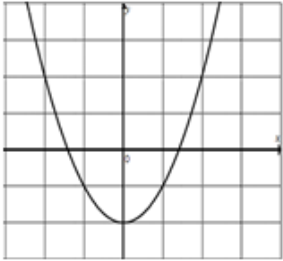
d) Equation: $y = -\dfrac{1}{2}(x-2)^2 + 7$
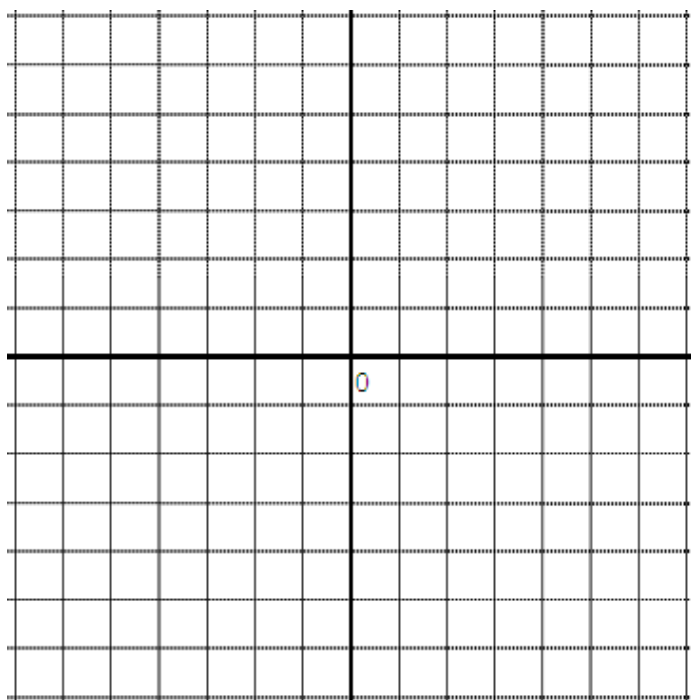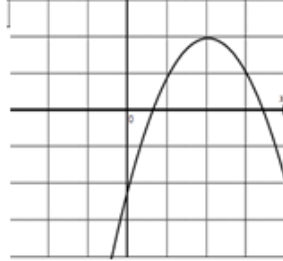
e) Equation: $y = 3(x-2)^2 - 5$

f) Equation: $y = -0.25(2x-6)^2 + 3$
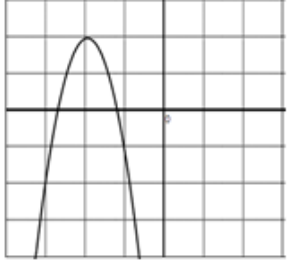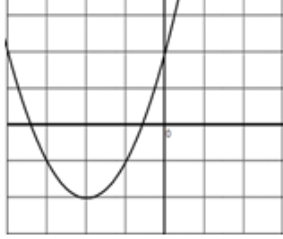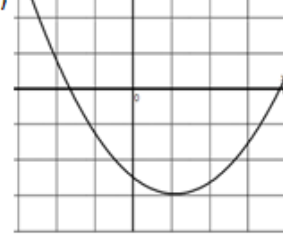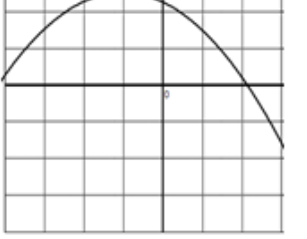
3. If each parabola is in the form of $y = a(x-p)^2 + q$, then which graph best describes each equation:

i) $a < -1, p < 0, q > 0$	
ii) $0 < a < 1, p > 0, q < 0$	
iii) $a > 0, p = 0, q < 0$	
iv) $0 > a > -1, p < 0, q > 0$	

a)

b)

c)

d)

e)

f)

4. What does it mean when two parabola functions are congruent?

5. The parabola $y = x^2$ is shifted 4 units to the right, 3 units down, and then flipped upside down over its vertex. What is the equation of the parabola now in APQ form?

6. The parabola $y = x^2 - 2x + 4$ is moved 'p" units to the right and "q" units down. The x-intercepts of the resulting parabola are 3 and 5. What are the values of "p" and "q"?