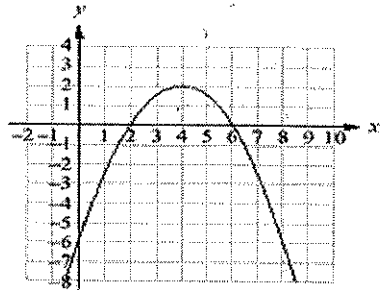


The Characteristics of Quadratic Graphs

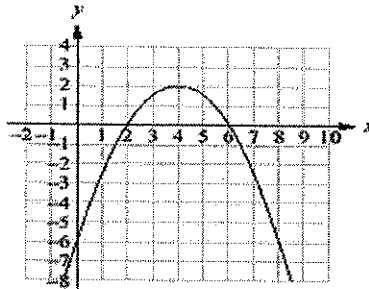
Vocab:

Vertex:



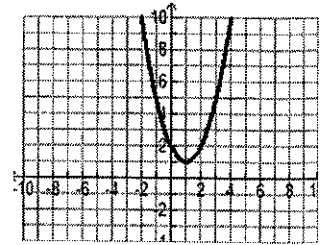
If it asks for vertex your answer will be **(x, y)**

Maximum



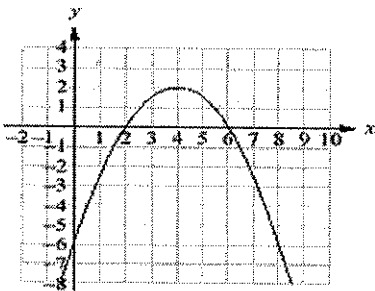
If it asks for maximum your answer will be **(x, y)**

Minimum



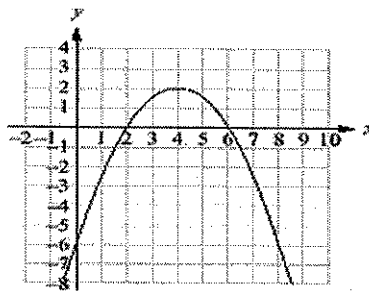
If it asks for minimum your answer will be **(x, y)**

Axis of symmetry:



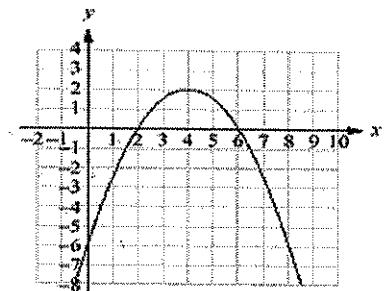
If it asks for axis of symmetry your answer will be **x = #**

Zeros:



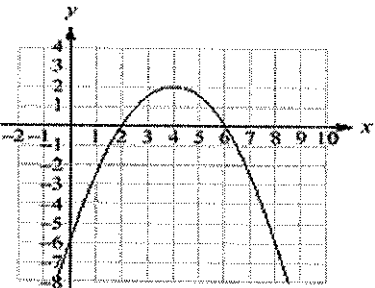
If it asks for zeros your answer will be: **(x, 0) and (x, 0)**

Y-Intercept:



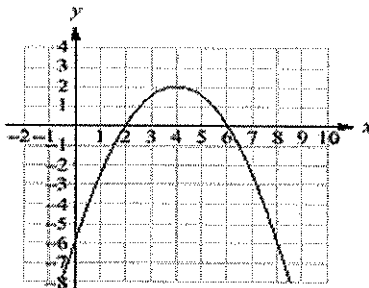
If it asks for y-intercept your answer will be **(0, y)**

Interval of Increase:



If it asks for interval of increase your answer will be **(-∞, #) or (#, ∞)**

Interval of Decrease:



If it asks for interval of decrease your answer will be **(-∞, #) or (#, ∞)**

Graph and identify the following

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

$\frac{-2}{2(-1)} = 1$

Vertex: (1, 4)

Maximum/Minimum?: MAXIMUM

Axis of Symmetry: x = 1

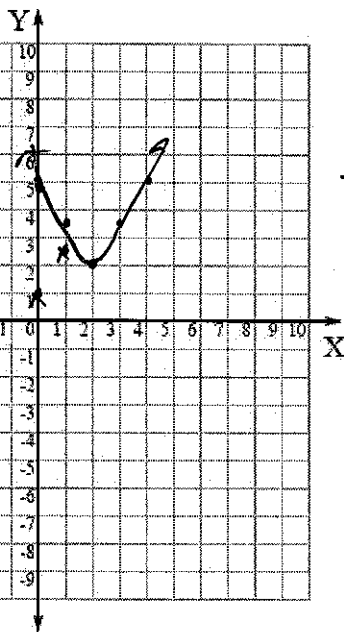
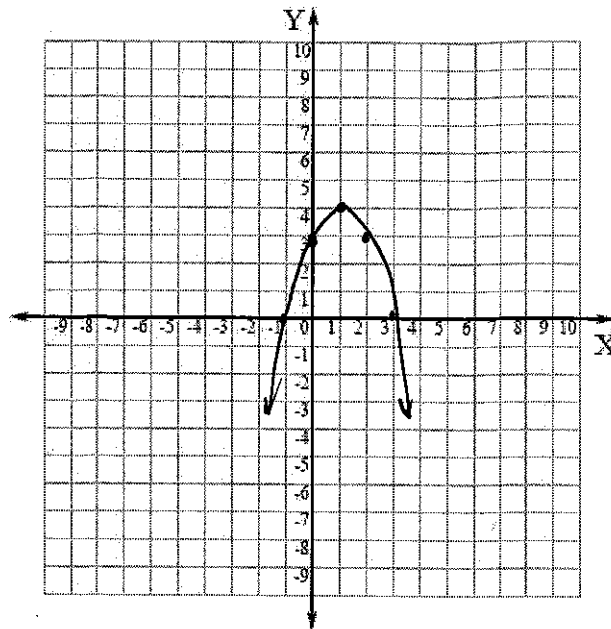
Zeros: (-1, 0) (3, 0)

Y-intercept: (0, 3)

Interval of increase: $(-\infty, 1)$

Interval of decrease: $(1, \infty)$

X	Y
-1	0
0	3
1	4
2	3
3	0



$y = \frac{1}{2}(x - 2)^2 + 3$

Vertex: (2, 3)

Maximum/Minimum: MINIMUM

Axis of Symmetry: x = 2

Zeros: NONE

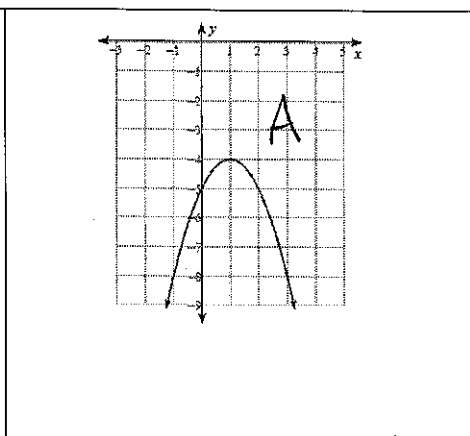
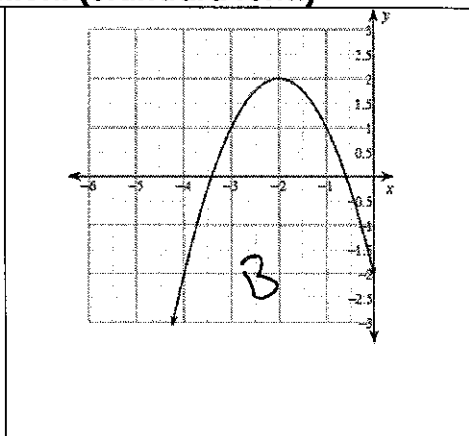
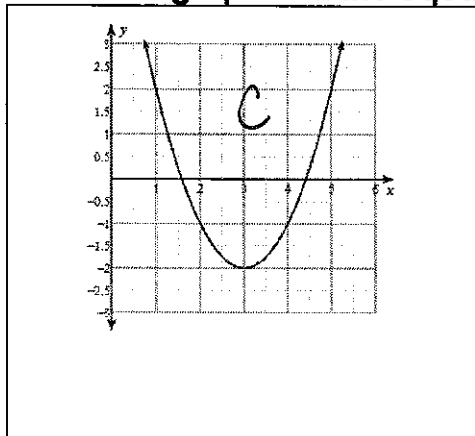
Y-intercept: (0, 5)

Interval of increase: $(2, \infty)$

Interval of decrease: $(-\infty, 2)$

X	Y
0	5
1	3.5
2	3
3	3.5
4	5

Match the graph with the equation! (Standard form)



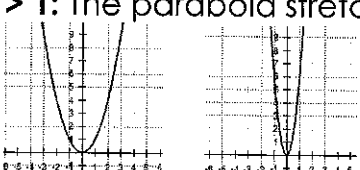
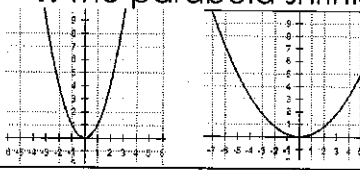
A. $-x^2 + 2x - 5$ $\frac{-2}{2(-1)} = 1$

B. $-x^2 - 4x - 2$ $\frac{4}{2(-1)} = -2$

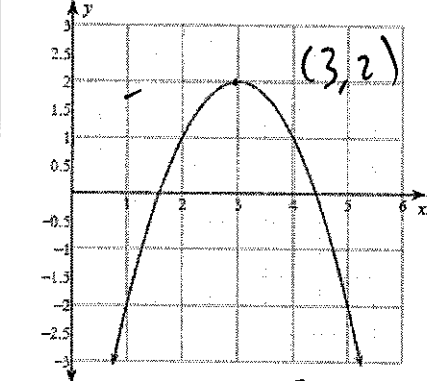
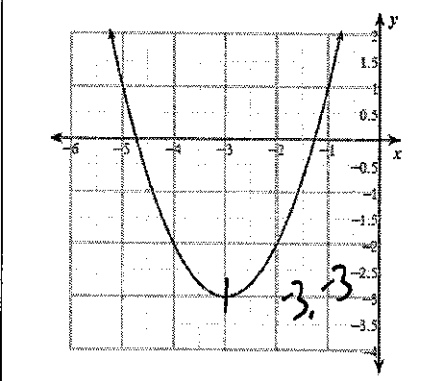
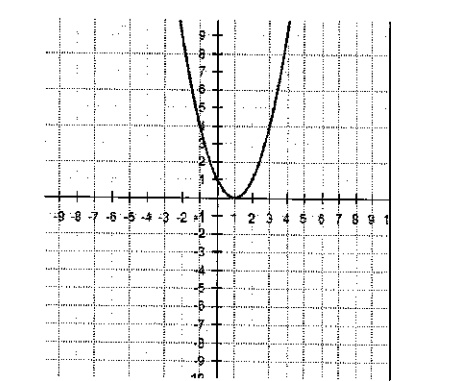
C. $f(x) = x^2 - 6x + 7$ $\frac{6}{2(1)} = 3$

How does vertex form move?

$$y = a(x - h)^2 + k$$

a	h	k
Positive: Up like a cup! <ul style="list-style-type: none"> Has a minimum Negative: Down like a frown <ul style="list-style-type: none"> Has a maximum (reflection over the x-axis) 	h = horizontal! $(x - h)^2$ <ul style="list-style-type: none"> Moves to right $(x + h)^2$ <ul style="list-style-type: none"> Moves to left 	k = vertical + k <ul style="list-style-type: none"> Moves up - k <ul style="list-style-type: none"> Moves down
a > 1: The parabola stretches 		
a < 1: The parabola shrinks 		

Write the equation of the graph! (Vertex form)

 <p>$y = -(x - 3)^2 + 2$</p>	 <p>$y = (x + 3)^2 - 3$</p>	 <p>$y = (x - 1)^2$</p>
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Describe the transformations of the following

$f(x) = -(x + 3)^2$ REFLECTION OVER X-AXIS LEFT 3	$f(x) = x^2 - 3$ DOWN 3	$f(x) = 2(x + 4)^2 + 2$ STRETCH OF 2 LEFT 4 UP 2
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Convert into Standard Form (hint just distribute and combine like terms!)

$f(x) = (x - 3)^2 + 2$ $(x - 3)(x - 3) + 2$ $x^2 - 6x - 6x + 9 + 2$ $x^2 - 12x + 11$	$f(x) = -(x - 2)^2 - 1$ $-(x - 2)(x - 2) - 1$ $-(x^2 - 2x - 2x + 4) - 1$ $-x^2 + 2x + 2x - 4 - 1$ $-x^2 + 4x - 5$	$f(x) = 2(x + 5)^2 + 3$ $2(x + 5)(x + 5) + 3$ $2(x^2 + 5x + 5x + 25) + 3$ $2x^2 + 10x + 10x + 50 + 3$ $2x^2 + 20x + 53$
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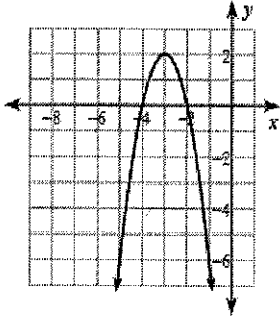
Which graph matches the standard form equation? (Hint: Find the vertex)

$\frac{-12}{2(2)} = 3$

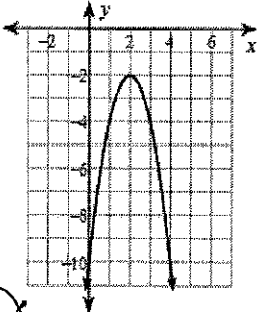
$y = -x^2 + 2x - 2$

$\frac{-2}{2(-1)} = 1$

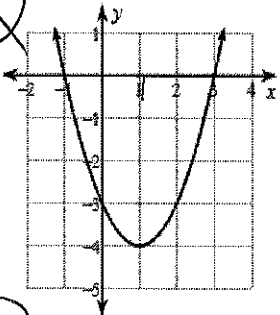
A)



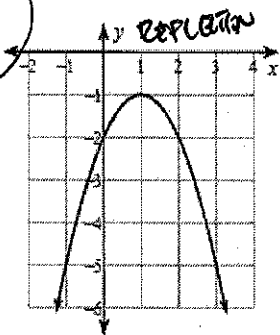
B)



~~C)~~



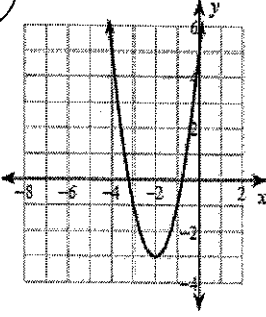
D)



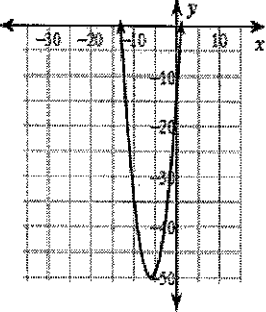
$y = 2x^2 + 8x + 5$

$\frac{-8}{2(2)} = -2$

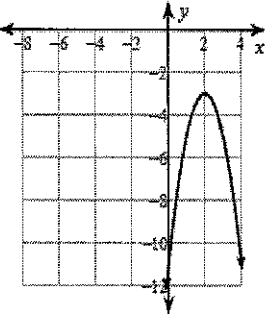
A)



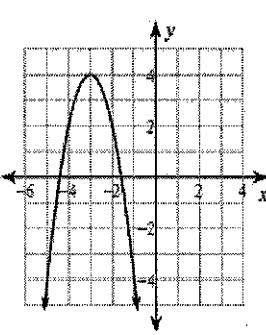
B)



C)



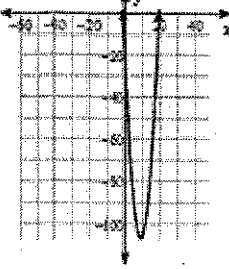
D)



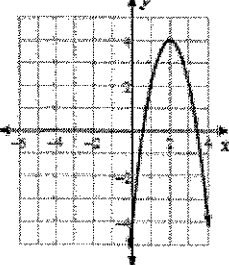
$y = -3x^2 + 18x - 26$

$\frac{-18}{2(-3)} = 3$

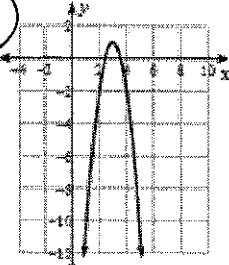
A)



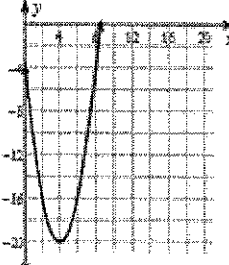
B)



~~C)~~

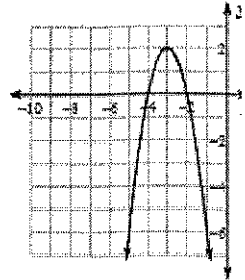


D)

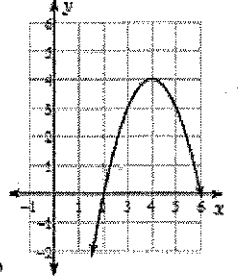


$y = -2x^2 + 12x - 14$

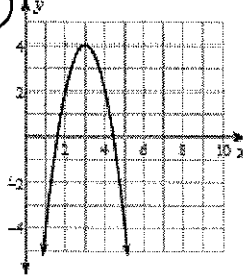
A)



B)



~~C)~~



D)

