

Use the quadratic equation to find VERTEX, AXIS OF SYMMETRY, and Y-INTERCEPT.

1)  $y = x^2 - 4x + 7$   
 $\frac{-b}{2a} = \frac{-(-4)}{2(1)} = \frac{4}{2} = 2$   
 $y = (2)^2 - 4(2) + 7$   
 $4 - 8 + 7$   
 $-4 + 7$   
 $3$

vertex: (2, 3)  
 Axis:  $x = 2$   
 Y-int: (0, 7)

2)  $y = 2x^2 - 4x - 1$   
 $\frac{-b}{2a} = \frac{-(-4)}{2(2)} = \frac{4}{4} = 1$   
 $y = 2(1)^2 - 4(1) - 1$   
 $2(1) - 4 - 1$   
 $2 - 4 - 1$   
 $-2 - 1 = -3$

vertex: (1, -3)  
 Axis:  $x = 1$   
 Y-int: (0, -1)

3)  $y = -2x^2 + 16x - 35$

$\frac{-b}{2a} = \frac{-16}{2(-2)} = \frac{-16}{-4} = 4$

$y = -2(4)^2 + 16(4) - 35$   
 $-2(16) + 64 - 35$   
 $-32 + 64 - 35$   
 $32 - 35 = -3$

vertex: (4, -3)  
 Axis:  $x = 4$   
 Y-int: (0, -35)

4)  $y = -x^2 - 6x - 10$

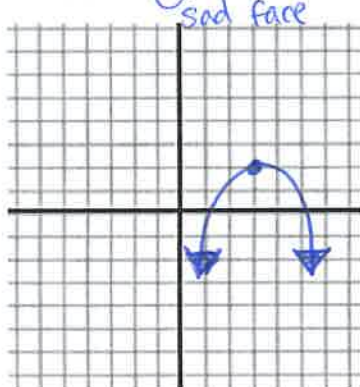
$\frac{-b}{2a} = \frac{-(-6)}{2(-1)} = \frac{6}{-2} = -3$

$y = -(-3)^2 - 6(-3) - 10$   
 $-(9) + 18 - 10$   
 $9 - 10 = -1$

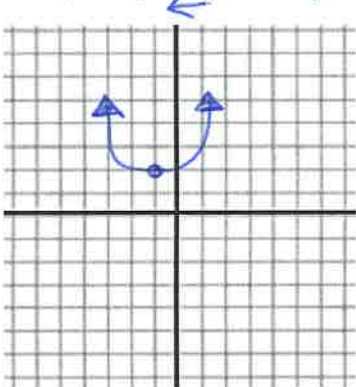
vertex: (-3, -1)  
 Axis:  $x = -3$   
 Y-int: (0, -10)

SKETCH the following quadratic functions from vertex form. (only need 1 point, like foldable)

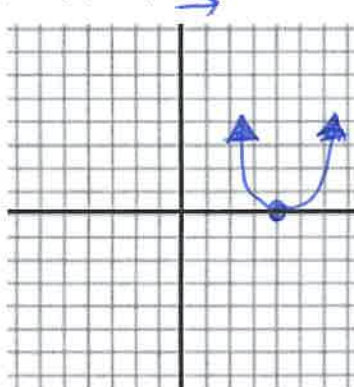
5)  $f(x) = -(x-3)^2 + 2$



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

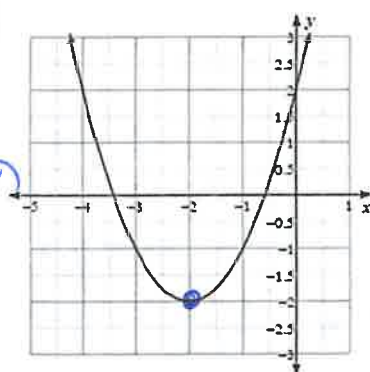


7)  $h(x) = (x-4)^2$



Write the equation that corresponds to the graph in VERTEX FORM.

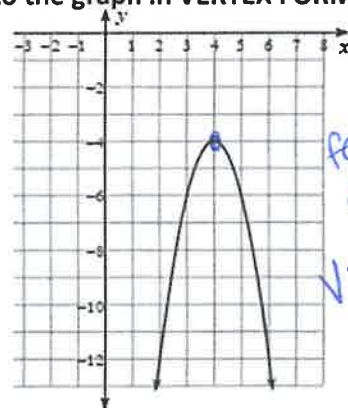
8)



faces up  
 V: (-2, -2)

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

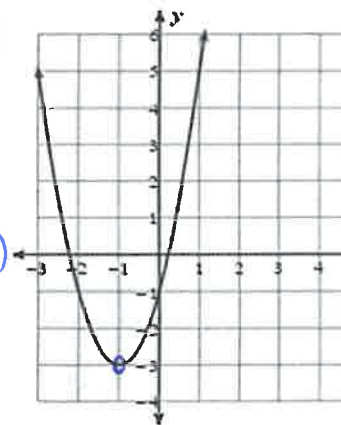
9)



faces down  
 V: (4, -4)

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

10)



faces up  
 V: (-1, -3)

$y = (x+1)^2 - 3$

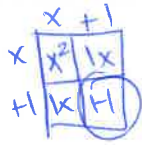
Convert the standard form equation into VERTEX FORM.

11)  $y = x^2 + 2x - 1$

$y + 1 = x^2 + 2x + 1$

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

$y = (x+1)^2 - 2$



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

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

$y + 1 = (x-2)(x-2) - 1$

$y = (x-2)^2 - 1$

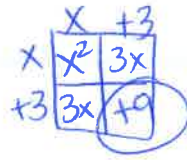
$(\frac{b}{2})^2 \rightarrow (\frac{-4}{2})^2 \rightarrow (-2)^2 \rightarrow 4$

13)  $y = x^2 + 6x + 7$

$y - 7 + 9 = x^2 + 6x + 9$

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

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



14)  $y = x^2 - 8x + 17$

$y - 17 + 16 = x^2 - 8x + 16$

$y - 1 = (x-4)(x-4) + 1$

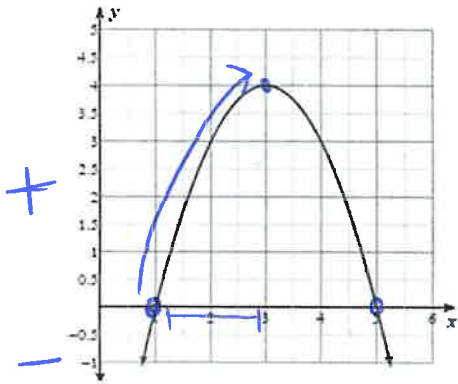
$y = (x-4)^2 + 1$

$(\frac{b}{2})^2 \rightarrow (\frac{-8}{2})^2 \rightarrow (-4)^2 \rightarrow 16$

Use the graphs to identify the ZEROS and the INTERVALS. (Remember: intervals are x-values only!)

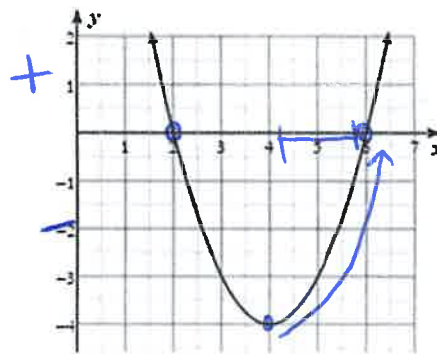
15) Positive & Increasing

16) Negative & Increasing



Interval: (1,3)

Zeros: (1,0)  
(5,0)

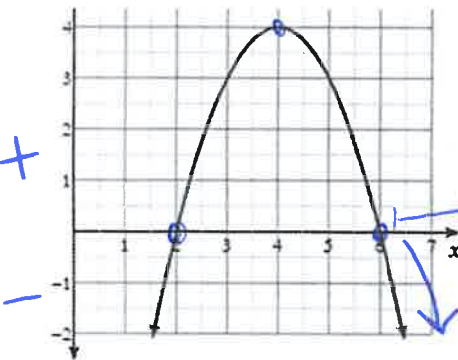


Interval: (4,6)

Zeros: (2,0)  
(6,0)

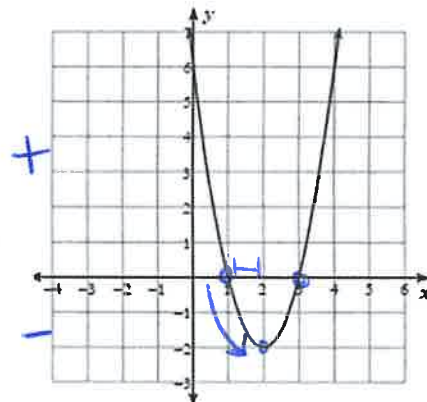
17) Negative & Decreasing

18) Negative & Decreasing



Interval: (6, infinity)

Zeros: (2,0)  
(6,0)



Interval: (1,2)

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