

Day 7: Graphing from Vertex Form

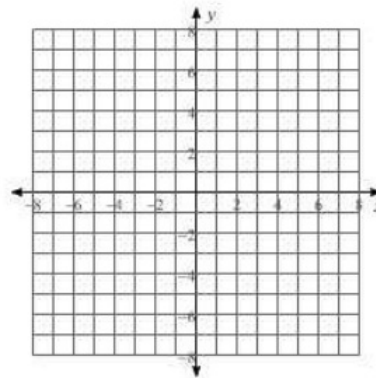
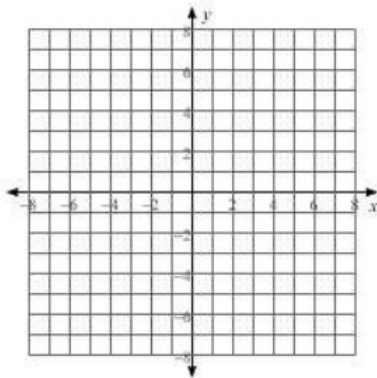
Date _____

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Pick x -values (be smart) and build a table to find the corresponding y -values. Then graph the quadratic function.

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

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



Graphing a quadratic equation in Vertex Form

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

3) Step 1: Find the Vertex.

Since the equation is in Vertex Form, the vertex will be at the point (h, k) .

Step 2: Identify the Axis of Symmetry.

Axis of Symmetry is the x -value of the vertex: $x = h$.

Step 3: Identify the Maximum or Minimum Value.

Maximum/Minimum is the y -value of the vertex: max/min: $y = k$

Step 4: Find the y -intercept.

To find the y -intercept, plug in $x = 0$ and solve for y .

Step 5: Find the x -intercept(s).

To find the x -intercept, plug in $y = 0$ and solve for x . You can solve for x by using the square root principle or the quadratic formula.

Step 6: Graph the parabola using the points found in steps 1 – 4.

Factored Form

$$y = A(x + m)(x + n)$$

Standard Form

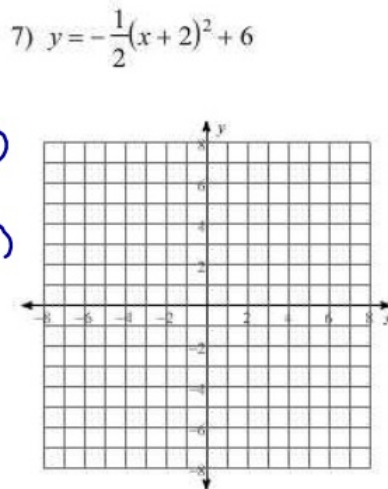
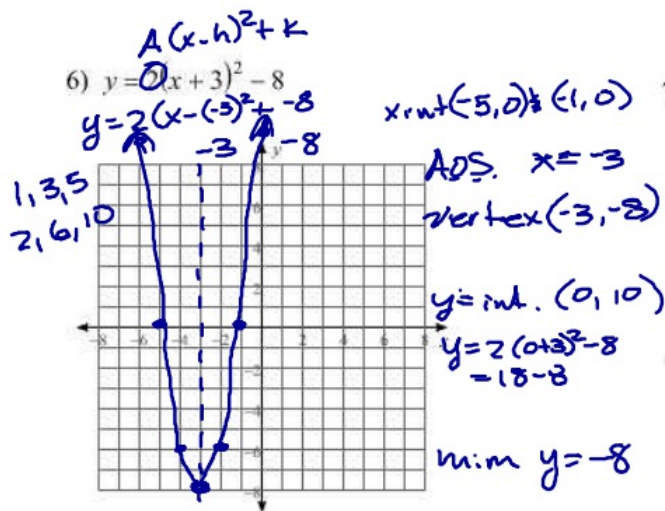
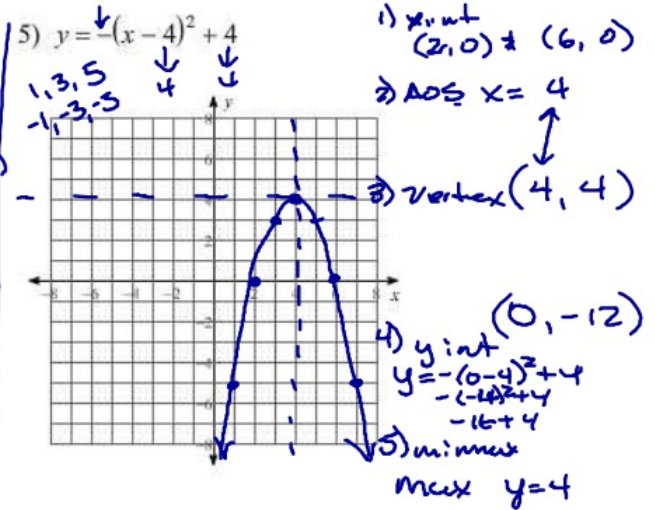
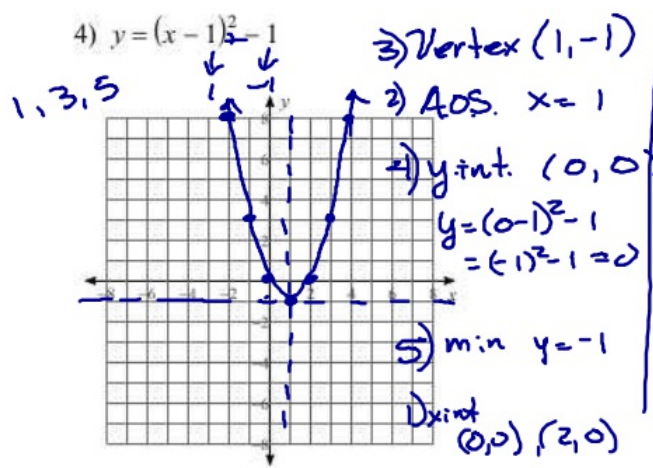
$$y = Ax^2 + Bx + C$$

Vertex Form

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

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

Graph the quadratic equation and identify all key features.



8) How can you find the exact values of the x-intercepts? What is the y-value for any point that crosses the x-axis?

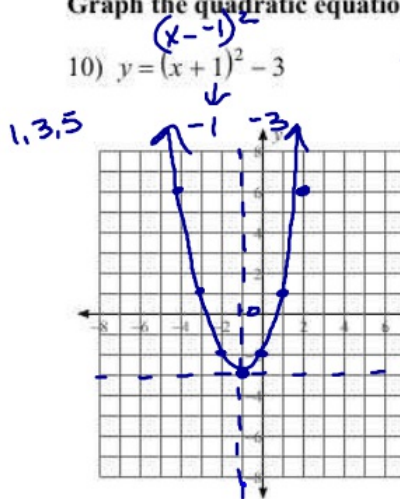
$$\sqrt{9} = \pm 3$$

9) Why does $\sqrt{9} = 3$ and $\sqrt{9} = -3$?

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

Graph the quadratic equation and identify all key features of the function.

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



AOS $x = -1$
Vertex $(-1, -3)$

y-int. $(0, -2)$

$$y = (0+1)^2 - 3$$

$$= (1)^2 - 3$$

$$= 1 - 3$$

$$= -2$$

min $y = -3$

x-int

$$0 = (x+1)^2 - 3$$

$$+3$$

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

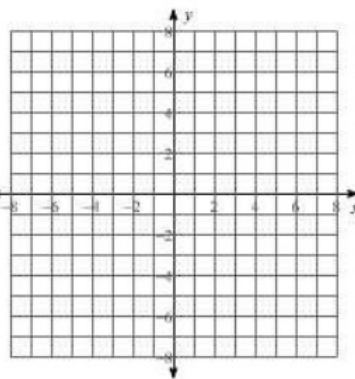
$$\pm\sqrt{3} = x+1$$

$$\pm\sqrt{3} - 1 = x$$

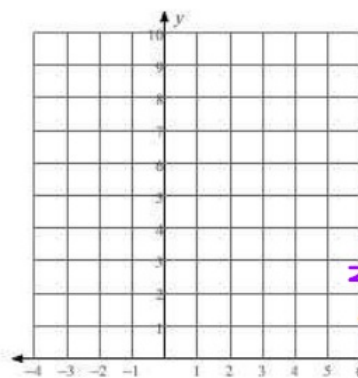
$$-1 \pm\sqrt{3} = x$$

x-int $(-1+\sqrt{3}, 0)$ & $(-1-\sqrt{3}, 0)$

11) $y = -2(x+1)^2 + 5$



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



x-int

$$0 = \frac{1}{2}(x-2)^2 + 3$$

$$-3$$

$$-6 = \frac{1}{2}(x-2)^2$$

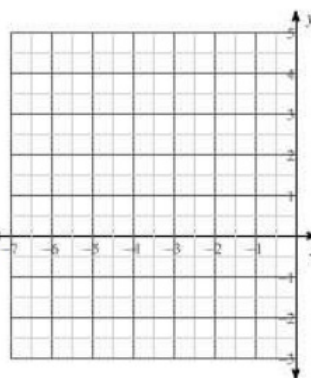
$$\sqrt{-6} = \sqrt{(x-2)^2}$$

$$\pm\sqrt{-6} = x-2$$

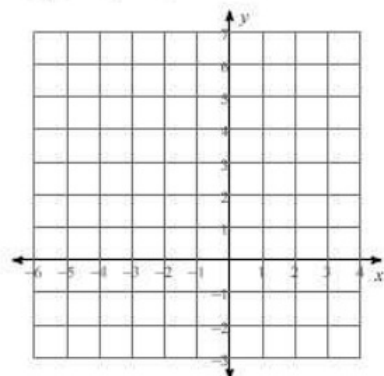
$$\pm\sqrt{-6} + 2 = x$$

$(2+i\sqrt{6}, 0), (2-i\sqrt{6}, 0)$

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



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



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

