

Algebra 2 Trig H
3.4 day 1 and day 2 practice

Name:

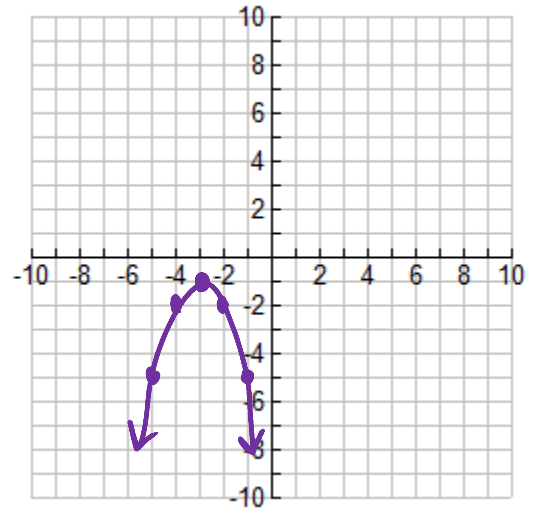
1. Graph $y = -(x+3)^2 - 1$ and identify the following:

Vertex: $(-3, -1)$

Axis of symmetry: $x = -3$

Does the graph open or down? *down*

Range: $y \leq -1$



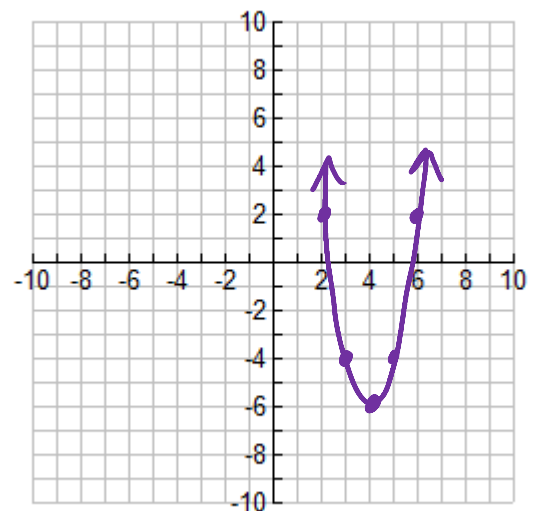
2. Graph $y = 2(x-4)^2 - 6$ and identify the following:

Vertex: $(4, -6)$

Axis of symmetry: $x = 4$

Does the graph open or down? *up*

Range: $y \geq -6$



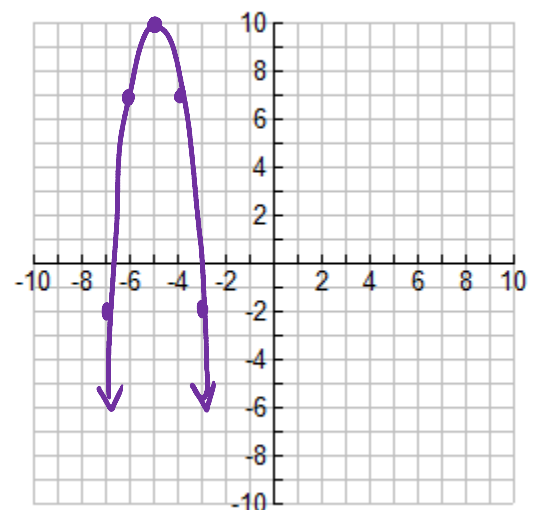
3. Graph $y = -3(x+5)^2 + 10$ and identify the following:

Vertex: $(-5, 10)$

Axis of symmetry: $x = -5$

Does the graph open or down? *down*

Range: $y \leq 10$



4. Complete the square of $y = x^2 - 8x + 7$. Then, graph and identify the following:

$$y = x^2 - 8x + 16 + 7 - 16$$

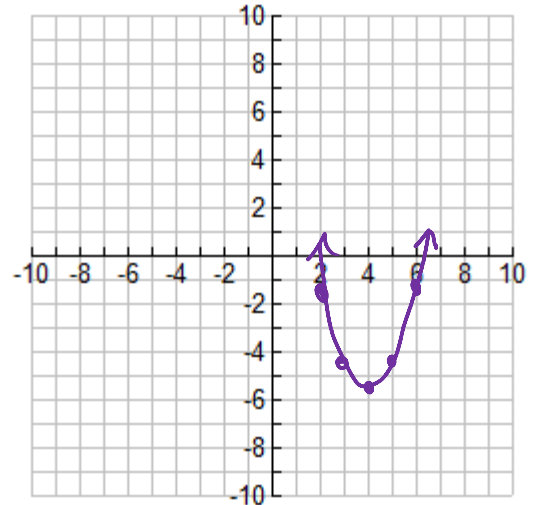
$$= (x - 4)^2 - 9$$

Vertex: $(4, -9)$

Axis of symmetry: $x = 4$

Does the graph open or down? *up*

Range: $y \geq -9$



5. Complete the square of $y = x^2 - 5x + 6$. Then, graph and identify the following:

$$y = x^2 - 5x + \frac{25}{4} + 6 - \frac{25}{4}$$

$$= \left(x - \frac{5}{2}\right)^2 - \frac{1}{4}$$

Vertex: $\left(\frac{5}{2}, -\frac{1}{4}\right)$

Axis of symmetry: $x = \frac{5}{2}$

Does the graph open or down? *up*

Range: $y \geq -\frac{1}{4}$

6. Complete the square of $y = 2x^2 + 12x + 9$. Then, graph and identify the following:

$$y = 2(x^2 + 6x) + 9$$

$$= 2(x^2 + 6x + 9) + 9 - 18$$

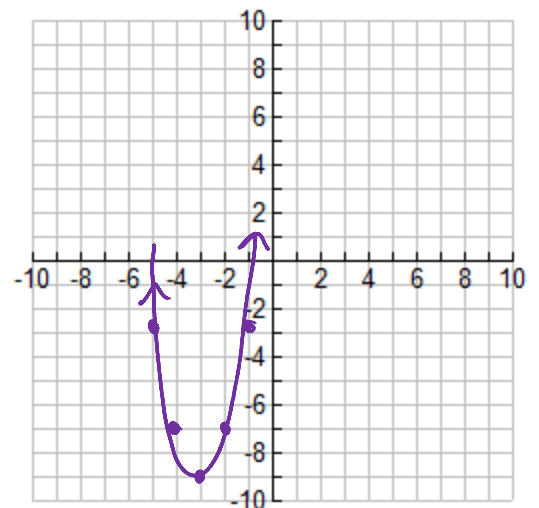
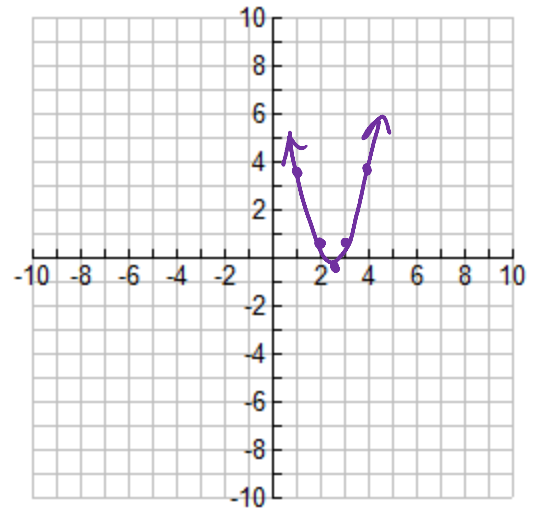
$$= 2(x + 3)^2 - 9$$

Vertex: $(-3, -9)$

Axis of symmetry: $x = -3$

Does the graph open or down? *up*

Range: $y \geq -9$



7. Complete the square of $y = -3x^2 - 12x - 2$. Then, graph and identify the following:

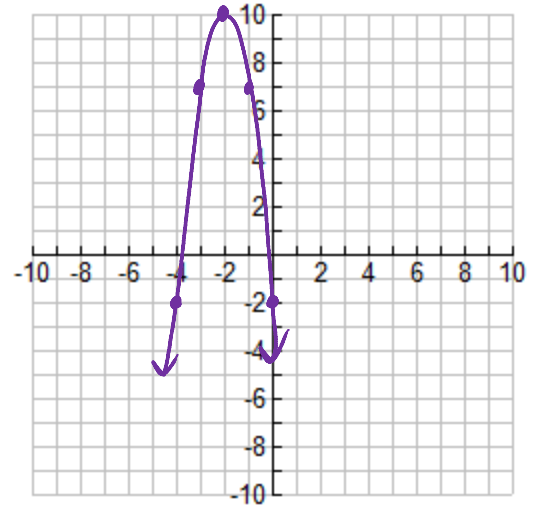
$$\begin{aligned} y &= -3(x^2 + 4x) - 2 \\ &= -3(x^2 + 4x + 4) - 2 + 12 \\ &= -3(x + 2)^2 + 10 \end{aligned}$$

Vertex: $(-2, 10)$

Axis of symmetry: $x = -2$

Does the graph open or down? *down*

Range: $y \leq 10$



8. Complete the square of $y = -2x^2 - 6x - 7$. Then, graph and identify the following:

$$\begin{aligned} y &= -2(x^2 + 3x) - 7 \\ &= -2(x^2 + 3x + \frac{9}{4}) - 7 + \frac{9}{2} \\ &= -2(x + \frac{3}{2})^2 - \frac{5}{2} \end{aligned}$$

Vertex: $(-\frac{3}{2}, -\frac{5}{2})$

Axis of symmetry: $x = -\frac{3}{2}$

Does the graph open or down? *down*

Range: $y \leq -\frac{5}{2}$

9. Complete the square of $y = \frac{1}{2}x^2 - 6x + 10$. Then, graph and identify the following:

$$\begin{aligned} y &= \frac{1}{2}(x^2 - 12x) + 10 \\ &= \frac{1}{2}(x^2 - 12x + 36) + 10 - 18 \\ &= \frac{1}{2}(x - 6)^2 - 8 \end{aligned}$$

Vertex: $(6, -8)$

Axis of symmetry: $x = 6$

Does the graph open or down? *up*

Range: $y \geq -8$

