

Practice

$$3(x+7)^2 - 12 = 63$$

$$\begin{array}{r} +12 \quad +12 \\ \hline 3(x+7)^2 = \frac{75}{3} \end{array}$$

$$\sqrt{(x+7)^2} = \sqrt{25}$$

$$x+7=5$$

$$\begin{array}{r} -7 \quad -7 \\ \hline \end{array}$$

$$\boxed{x = -2}$$

$$x+7=-5$$

$$\begin{array}{r} -7 \quad -7 \\ \hline \end{array}$$

$$\boxed{x = -12}$$

$$\begin{array}{r} -|x-8| + 4 = 21 \\ -4 \quad -4 \\ \hline \end{array}$$

$$\begin{array}{r} -|x-8| = \frac{17}{-1} \\ -1 \quad -1 \\ \hline \end{array}$$

$$|x-8| = \textcircled{-17}$$

no solution

$$\begin{array}{r} -(x-8)^2 + 4 = 21 \\ -4 \quad -4 \\ \hline \end{array}$$

$$\begin{array}{r} -(x-8)^2 = \frac{17}{-1} \\ -1 \quad -1 \\ \hline \end{array}$$

$$(x-8)^2 = \textcircled{-17}$$

no solution

Identifying the vertex in vertex form.

$$y = -|x + 7| - 11$$

h = -7 k = -11

vertex @ (-7, -11)

$$y = 5(x - 1)^2 + 9$$

h = 1 k = 9

vertex @ (1, 9)

PRACTICE: identify the vertex in each equation.

1. $y = (x - 3)^2 - 14$

(3, -14)

2. $y = 7|-x + 6| + 6$

(-6, 6)

3. $y = |x| - 8$

(0, -8)

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

(4, 0)

Standard Form

$$y = ax^2 + bx + c$$

constants

- * can convert to from vertex form (expand/simplify)
- * can convert to vertex form (by completing the square)
- * can convert to factored form (by multiplying binomials)

Solve for x.

1. $-2|x+3|+1=-7$

2. $4(x-5)^2-8=56$

$$\begin{array}{r} -2|x+3|+1=-7 \\ \underline{-1 \quad -1} \end{array}$$

$$\begin{array}{r} -2|x+3|=-8 \\ \underline{-2 \quad -2} \end{array}$$

$$|x+3|=4$$

$$\begin{array}{r} x+3=4 \\ \underline{-3 \quad -3} \end{array}$$

$$\boxed{x=1}$$

$$\begin{array}{r} x+3=-4 \\ \underline{-3 \quad -3} \end{array}$$

$$\boxed{x=-7}$$

$$\begin{array}{r} 4(x-5)^2-8=56 \\ \underline{+8 \quad +8} \end{array}$$

$$\begin{array}{r} 4(x-5)^2=64 \\ \underline{4 \quad 4} \end{array}$$

$$\sqrt{(x-5)^2}=\sqrt{16}$$

$$\begin{array}{r} x-5=4 \\ \underline{+5 \quad +5} \end{array}$$

$$\boxed{x=9}$$

$$\begin{array}{r} x-5=-4 \\ \underline{+5 \quad +5} \end{array}$$

$$\boxed{x=1}$$

Vertex Form

$$y = a|x-h| + k$$

vertex
(h,k)

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

vertex
(h,k)

- * good form for graphing/finding the VERTEX (h,k)
- * good form to solve if given an x or y value