

Translations

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

h k

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

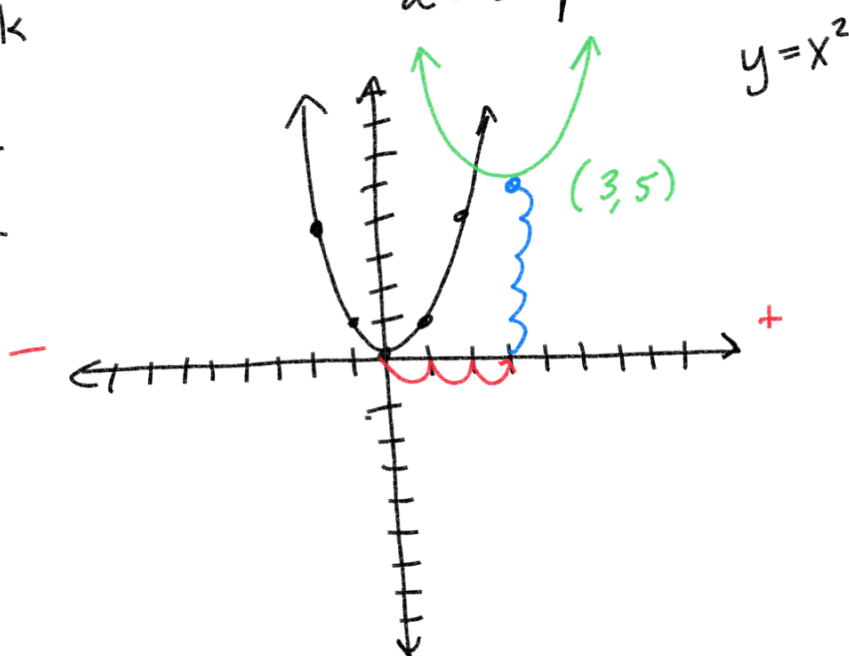
move right 3
move up 5

Vertex Form

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

vertex (h, k)

a = slope



Quadratic Form

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

slope y-int

Vertex Form

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

slope vertex

Completing the Square

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

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

opposite \downarrow
(h, k)

$$y = x^2 - 2x - 3 \longrightarrow$$

Step 1: 2020 it
quarantine

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

Step 2: factor out the
[skip] "a" term

$$b = \left(\frac{-2}{2}\right)^2 = 1 \quad -1$$

$$\text{Step 3: } \left(\frac{b}{2}\right)^2$$

Step 4: Square roots

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

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

vertex form

$$\text{vertex: } (1, -4)$$

$$y = x^2 + 4x + 6$$

Step 1: quarantine

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

Step 2: factor out "a"

$$\text{Step 3: } \left(\frac{b}{2}\right)^2$$

$$b = 4$$

$$+4 \quad -4$$

Step 4: Square roots

$$\left(\frac{4}{2}\right)^2 = 4$$

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

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

$$\text{vertex: } (-2, 2)$$

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

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

Give the equation
in vertex form

Step 1: quarantine

Step 2: factor out the "a"

Step 3: $\left(\frac{b}{2}\right)^2$

Step 4: Square Roots

$$\text{vertex: } (-3, -18)$$

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

\uparrow \uparrow
 $+9$ -9

$\left(\frac{b}{2}\right)^2$
 $(\frac{6}{2})^2$
 9

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

$\sqrt{x^2}$ \downarrow \downarrow \downarrow $\sqrt{9}$
 \downarrow \downarrow \downarrow \downarrow
 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

$$y = (x + 3)^2 - 18$$

$$y = 4x^2 + 8x - 3$$

Step 1: quarantine

Step 2: Factor out "a"

Step 3: $\left(\frac{b}{2}\right)^2$

Step 4: Square Roots

$$\text{vertex: } (-1, -7)$$

$$\left(\frac{4x^2 + 8x}{4}\right) - 3$$

$$\boxed{4}(x^2 + 2x) - 3$$

\uparrow \uparrow
 $\boxed{+1}$ $-1(4)$

$b = 2$
 $\left(\frac{2}{2}\right)^2 = 1$

$$y = 4(x^2 + 2x + 1) - 3 - 4$$

$\sqrt{x^2}$ \downarrow \downarrow \downarrow $\sqrt{1}$
 \downarrow \downarrow \downarrow \downarrow
 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

$$y = 4(x + 1)^2 - 7$$

$$y = 3x^2 + 24x + 18$$

$$y = (3x^2 + 24x) + 18$$

$$3(x^2 + 8x) + 18$$

$$\left(\frac{8}{2}\right)^2$$

$$(4)^2$$

$$+16$$

$$-16(3)$$

$$3(x^2 + 8x + 16) + 18 - 48$$

$$3(x + 4)^2 - 30$$

Step 1: Quarantine

Step 2: Factor out a

Step 3: $\left(\frac{b}{2}\right)^2$

Step 4: Square Roots

$$\text{Vertex: } (-4, -30)$$

HW

Ch 5.3 (evens)

Supplemental Worksheet

Online HW 23

Quiz 23

} due March 24th

HW/Quiz 21 due today