



Graphing Quadratic Relations in Vertex Form

Video Notes

[Video Link](#)

Graphing Quadratic Relations in Vertex Form

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

Background Information:

- Transformations of Quadratic Graphs (a , k , and h)
- Step Patterns of Quadratics
- Finding the vertex of parabolas

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

1. Find the vertex

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

$h = 5, k = 2$ vertex: $(5, 2)$

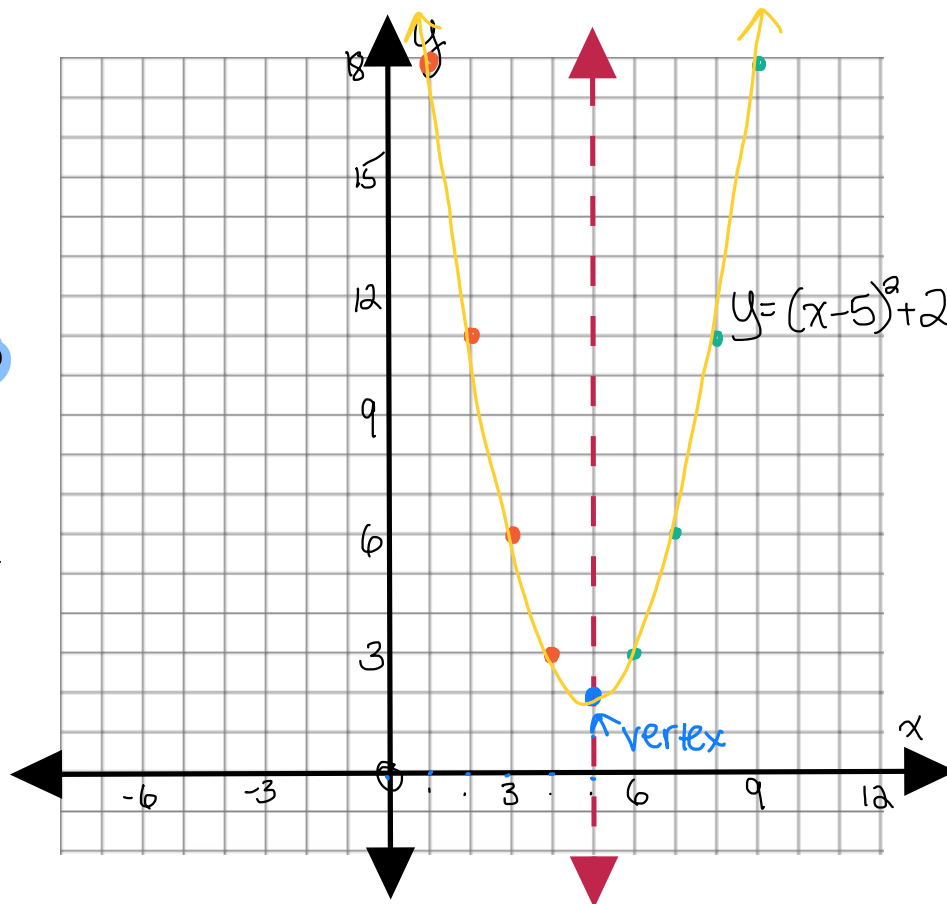
2. Determine the step-pattern.

$1a, 3a, 5a, 7a, \dots$ $a = 1$

$1(1), 3(1), 5(1), 7(1), \dots$

$1, 3, 5, 7, \dots$

3. Use the step-pattern to draw half of the parabola.



4. Reflect what you have over the line/axis of symmetry to draw the other half of the parabola.

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

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

vertex: $(-1, -4)$

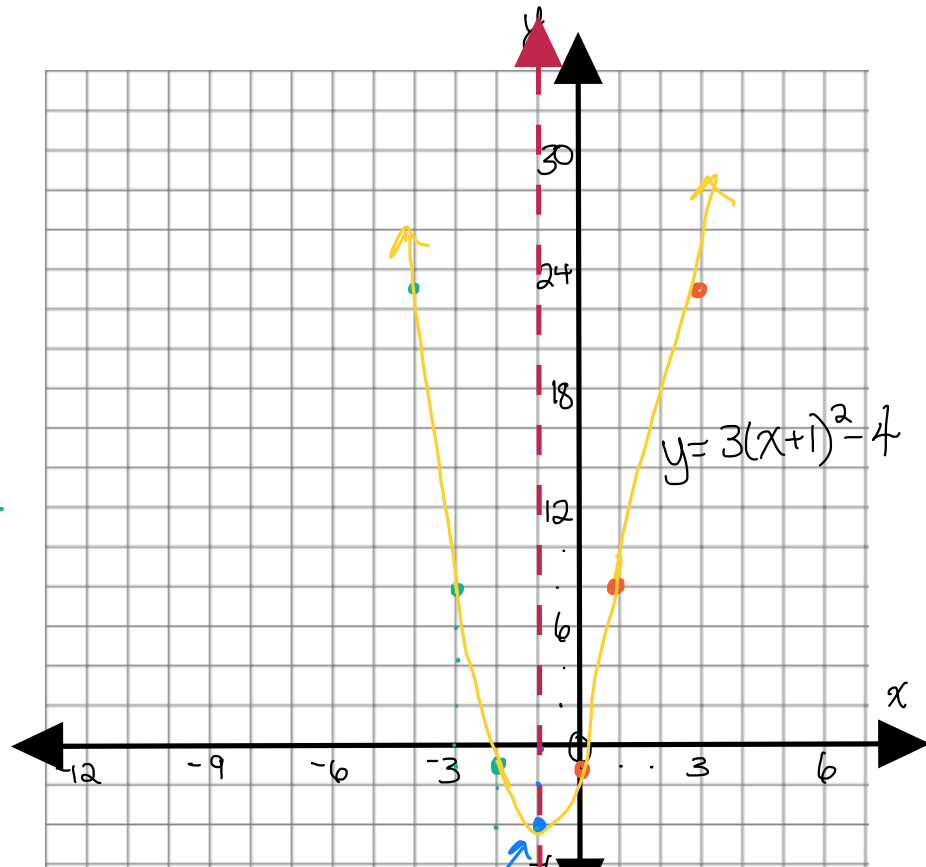
Step Pattern:

$1a, 3a, 5a, 7a, \dots$

$a = 3$

$1(3), 3(3), 5(3), 7(3), \dots$

$3, 9, 15, 21, \dots$



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

Graph: $y = \frac{1}{2}(x-9)^2 - 3$

vertex: $(9, -3)$

Step Pattern: $\frac{1}{2}, \frac{3}{2}, \frac{5}{2}, \frac{7}{2}, \dots$

OR
 $0.5, 1.5, 2.5, 3.5, \dots$

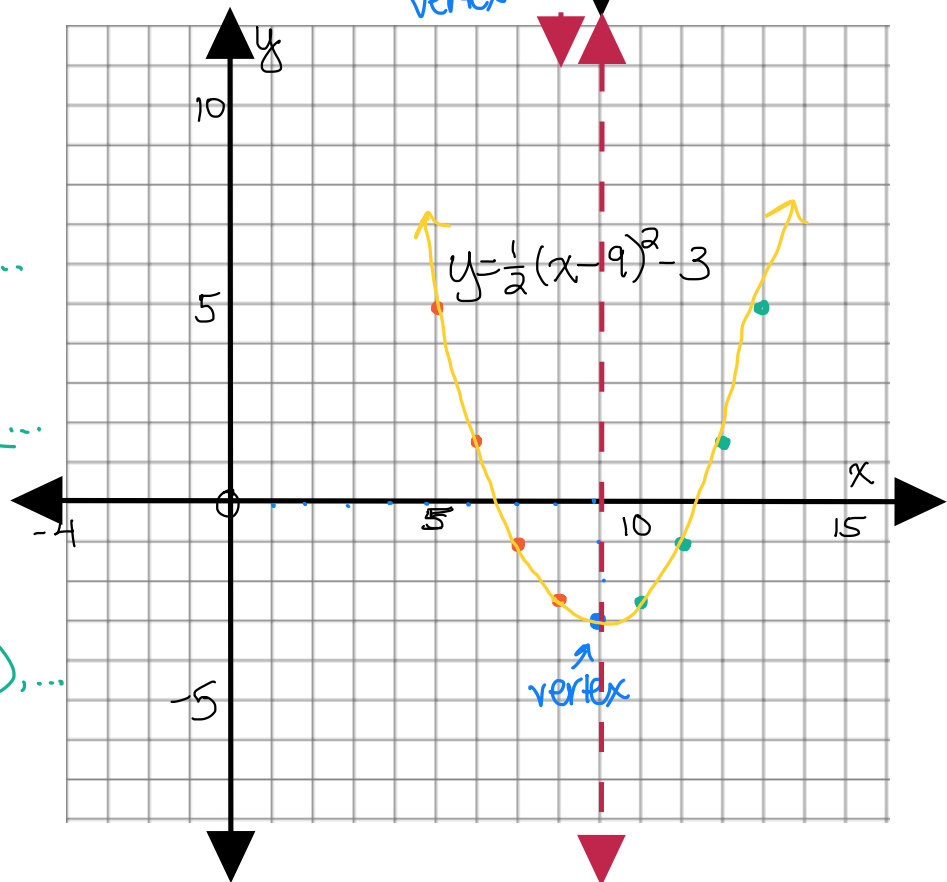
$1a, 3a, 5a, 7a, \dots$

$a = \frac{1}{2}$

$1(\frac{1}{2}), 3(\frac{1}{2}), 5(\frac{1}{2}), 7(\frac{1}{2}), \dots$

$\frac{1}{2}, \frac{3}{2}, \frac{5}{2}, \frac{7}{2}, \dots$

$0.5, 1.5, 2.5, 3.5, \dots$



Graph: $y = a(x-h)^2 + k$
 $y = -2(x+3)^2 + 7$

Vertex: $(-3, 7)$

Step Pattern: $-2, -6, -10, -14, \dots$

$|a, 3a, 5a, 7a, \dots$

$a = -2$

$1(-2), 3(-2), 5(-2), 7(-2), \dots$

$\downarrow \quad \downarrow \quad \downarrow \quad \downarrow$
 $-2, -6, -10, -14, \dots$

