



Finding the Vertex of a Parabola of the Form

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

Video Notes

[Video Link](#)

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VERTEX FORM!

Background Information:

- Transformations of Quadratic Graphs (a , k , and h)

Find the vertex of the parabola of the equation $y = (x - 5)^2 + 2$.

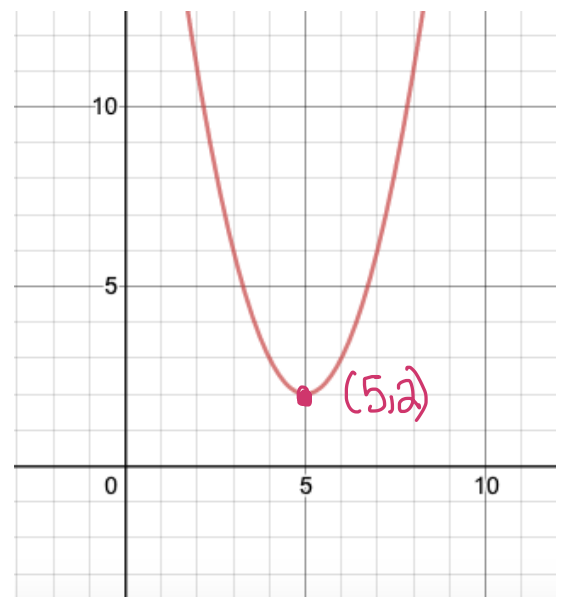
vertex: $(5, 2)$

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

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

$a = 1$ $h = 5$ $k = 2$

(h, k)
 $(5, 2)$



What is vertex form?

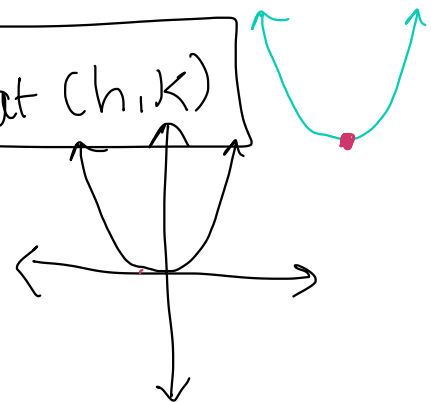
$\therefore y = a(x - h)^2 + k \rightarrow$ the vertex is at (h, k)

$a \rightarrow$ vertical stretch/compression

$k \rightarrow$ vertical translation

$h \rightarrow$ horizontal translation

(x, y)
 (h, k)



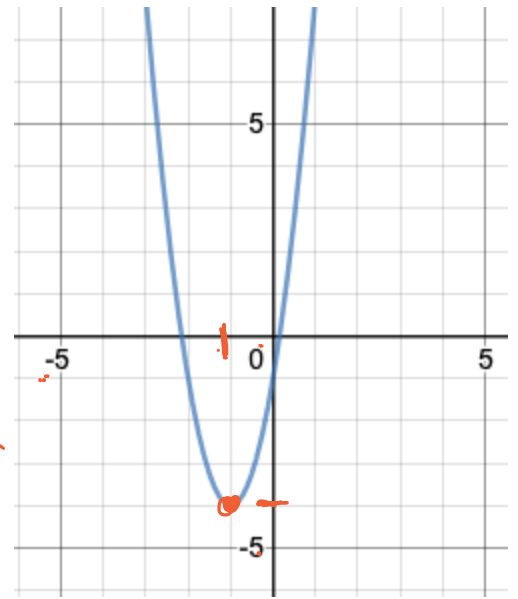
Find the vertex of the parabola with the equation $y = 3(x + 1)^2 - 4$.

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

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

$$(h, k)$$

$$(-1, -4) \rightarrow \text{min}$$



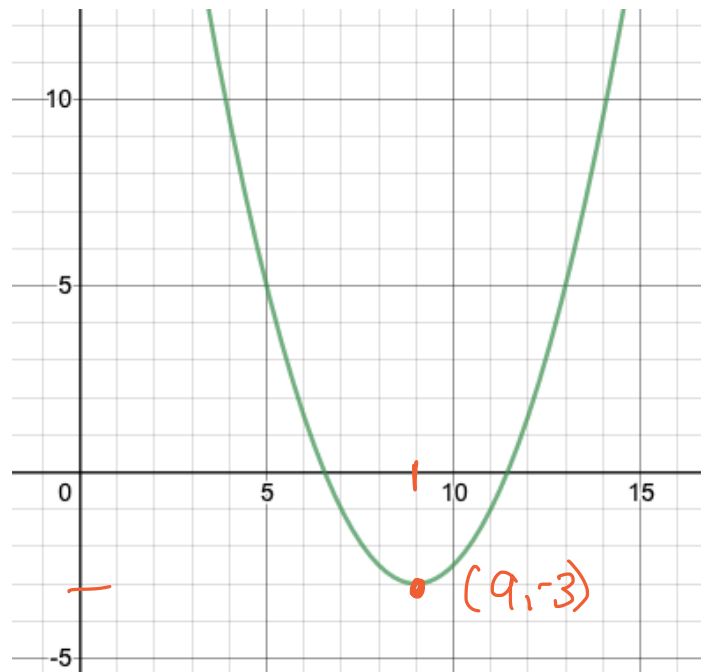
Find the vertex of the parabola with the equation $y = \frac{1}{2}(x - 9)^2 - 3$.

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

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

$$(h, k)$$

$$(9, -3)$$



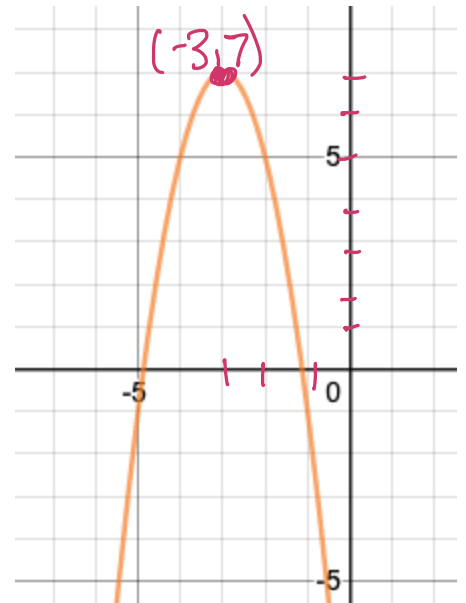
Find the vertex of the parabola with the equation $y = -2(x + 3)^2 + 7$.

$$y = -2(x + 3)^2 + 7$$

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

$$(h, k)$$

$$(-3, 7) \rightarrow \text{max} \quad \curvearrowright$$



Conclusion:

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

VERTEX FORM

vertex will always occur
at (h, k)