C11 - 3.4 - Find Vertex Form Vertex Point Notes

Using the vertex and a point on the parabola, find the equation in Vertex Form.

Vertex: $(-1,-4)$ ***and Point***: $(-2,-3)$

$y = a(x-p)^2 + q$ Write Vertex Form

$y = a\big(x-(-1)\big)^2 - 4$ Substitute Vertex for (p,q) $(-1,-4)$

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

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

$-3 = a(-1)^2 - 4$

$-3 = 1a - 4$

$+4 \qquad +4$

$1 = 1a$

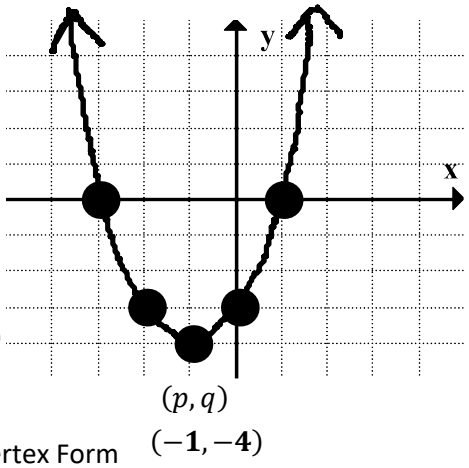
$\frac{1}{1} = \frac{1a}{1}$

$1 = a$

$a = 1$ Solve for a.

$y = 1(x+1)^2 - 4$ Substitute 'a' and Vertex into Vertex Form

$y = a(x-p)^2 + q$



Vertex: $(3,-2)$ ***and*** $x-$***intercept*** $= 4$ (4,0)

$y = a(x-p)^2 + q$

$y = a\big(x-(3)\big)^2 - 2$

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

$0 = a(4-3)^2 - 2$

$0 = a(1)^2 - 2$

$0 = 1a - 2$

$+2 \qquad +2$

$2 = a$

$a = 2$

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

Draw on Graph

Check on Graphing Calculator Table of Values