3 E X A M P L E   Writing Equations in Vertex Form

Write the vertex form of the quadratic function whose graph is shown.

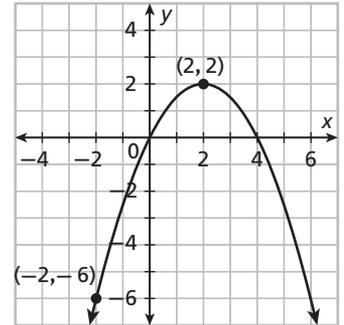**A**   Use the vertex of the graph to identify the values of h and k.

The vertex of the graph is _____.

$h = \boxed{}$

$k = \boxed{}$

Substitute the values of h and k into the vertex form:

$f(x) = a\left(x - \boxed{}\right)^2 + \boxed{}$

B   Use the point $(-2, -6)$ to identify the value of a.

$f(x) = a(x - 2)^2 + 2$ Vertex form

$\boxed{} = a\left(\boxed{} - 2\right)^2 + 2$ Substitute -6 for $f(x)$ and -2 for x.

$-6 = a\left(\boxed{}\right) + 2$ Simplify.

$\boxed{} = a(16)$ Subtract 2 from both sides.

$\boxed{} = a$ Divide both sides by 16.

Substitute the value of a into the vertex form:

$f(x) = \boxed{} (x - 2)^2 + 2$

So, the vertex form of the function shown in the graph is

_____ .

REFLECT

3a. How can you tell by looking at the graph that the value of a is negative?

_____

_____

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3b. Describe the graph of the given function as a transformation of the parent quadratic function.

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