

# Writing Absolute Value Equations

If you know the vertex and one other point of an absolute value graph, then you can write its equation.

Use the formula for slope  $m = \frac{y_2 - y_1}{x_2 - x_1}$  and common sense to fill in the equation:  $y = a|x - h| + k$

Write the equation of the absolute value function that has vertex  $(-2, 5)$  and passes through  $(6, 1)$ .

$$\text{Find the slope: } m = \frac{1-5}{6-(-2)} \rightarrow m = \frac{-4}{8} \rightarrow m = \frac{-1}{2}$$

$$\text{Therefore, } a = \frac{1}{2}$$

Use common sense to determine if the graph opens up or down. The point  $(6, 1)$  is below the vertex  $(-2, 5)$ , the graph opens down. Thus, “a” is negative.

Fill in the formula:  $y = a|x - h| + k$

$$y = \frac{-1}{2}|x + 2| + 5$$