

## Horizontal and Vertical Shifting Example

## Horizontal and Vertical Shifting Example

**Example:** Sketch the graph of:

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

## Horizontal and Vertical Shifting Example

**Example:** Sketch the graph of:

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

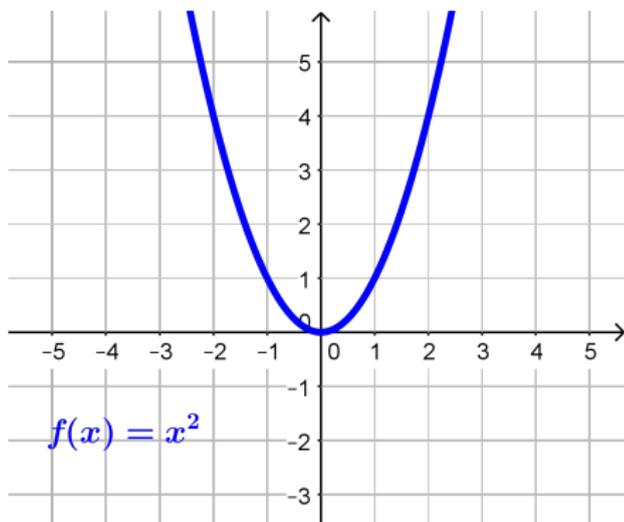
We could start from scratch, picking  $x$ -values and evaluating to find  $y$ -values until we have enough points to see the graph.

## Horizontal and Vertical Shifting Example

**Example:** Sketch the graph of:

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

We could start from scratch, picking  $x$ -values and evaluating to find  $y$ -values until we have enough points to see the graph. Instead, let's start with the basic graph:  $f(x) = x^2$



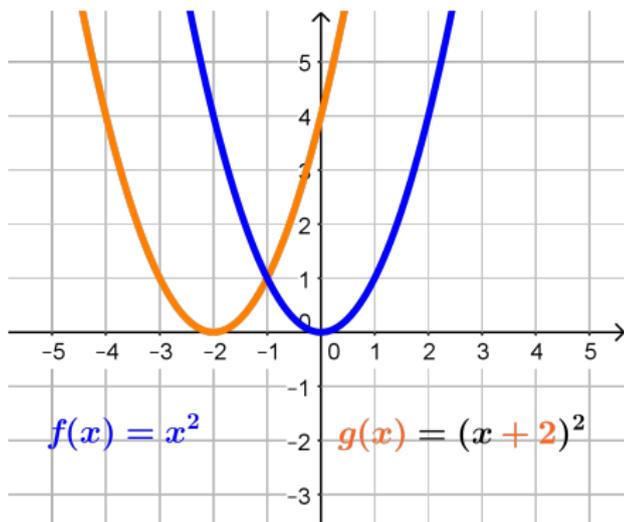
## Horizontal and Vertical Shifting Example

**Example:** Sketch the graph of:

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

We could start from scratch, picking  $x$ -values and evaluating to find  $y$ -values until we have enough points to see the graph. Instead, let's start with the basic graph:  $f(x) = x^2$

We graph  $g(x) = f(x+2) = (x+2)^2$  by ▶ shifting  $f(x)$  left by 2



# Horizontal and Vertical Shifting Example

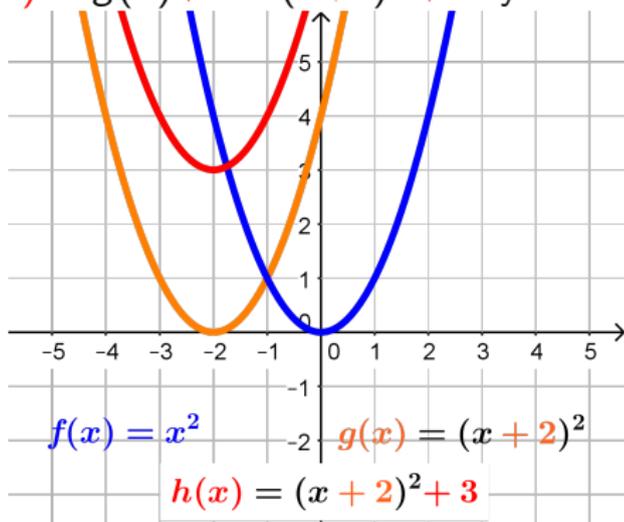
**Example:** Sketch the graph of:

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

We could start from scratch, picking  $x$ -values and evaluating to find  $y$ -values until we have enough points to see the graph. Instead, let's start with the basic graph:  $f(x) = x^2$

We graph  $g(x) = f(x+2) = (x+2)^2$  by **shifting**  $f(x)$  left by 2

We graph  $h(x) = g(x) + 3 = (x+2)^2 + 3$  by **shifting**  $g(x)$  up 3



# Horizontal and Vertical Shifting Example

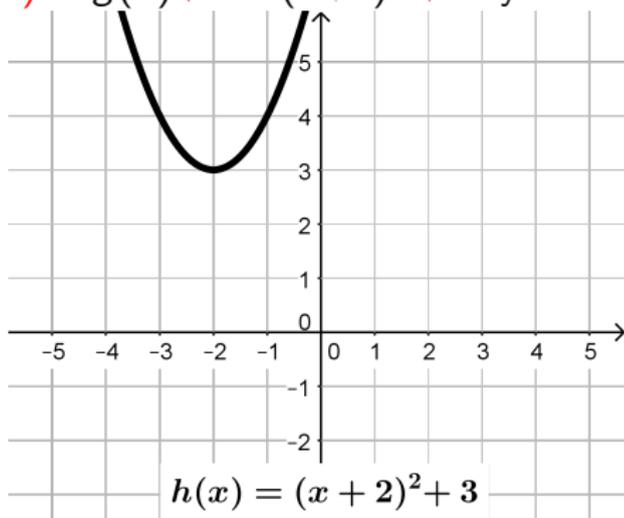
**Example:** Sketch the graph of:

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

We could start from scratch, picking  $x$ -values and evaluating to find  $y$ -values until we have enough points to see the graph. Instead, let's start with the basic graph:  $f(x) = x^2$

We graph  $g(x) = f(x+2) = (x+2)^2$  by **shifting**  $f(x)$  left by 2

We graph  $h(x) = g(x)+3 = (x+2)^2 + 3$  by **shifting**  $g(x)$  up 3



$y = (x + 2)^2 + 3$  has graph of  $f(x) = x^2$  shifted left 2 & up 3