Objective 81-82

Vertical Translations

Determine the effect of replacing f(x) with f(x) + k on the graph of a linear or exponential function

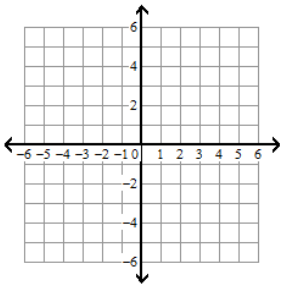
Vocab:

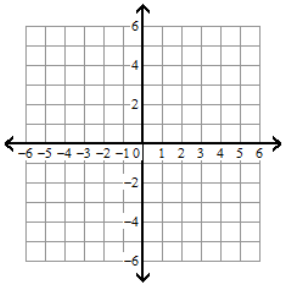
Translation: "Sliding": moving a shape/equation without rotating or flipping it. The shape/equation still looks exactly the same, just in a different place.

Example 1:

1. Graph the following equations: y= 2x and y=2x+3

$y = 2x$ $y = 2x + 3$



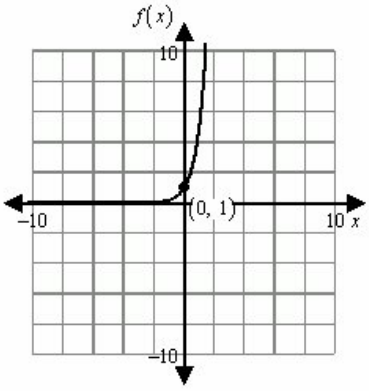


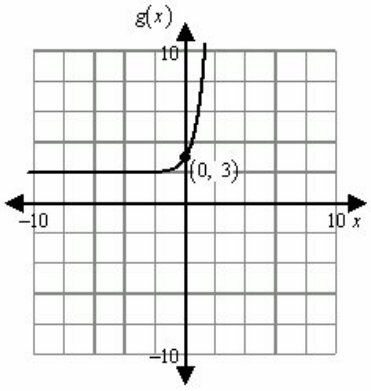
2. Compare and contrast the two graphs

Similarities Differences

Example 2:

The graph of $g(x)$ is obtained by vertically translating the graph of $f(x)$.





If $f(x) = 5^x$, what is the equation for $g(x)$?

Hint: Look at the amount the graph is vertically translated

Practice:

1. How is the graph of $g(x)=\left(\frac{1}{3}\right)^x+4$ related to the graph of $f(x)=\left(\frac{1}{3}\right)^x$?

2. How is the graph of $g(x)=-6x+3$ related to the graph of $f(x)=-6x$?

3. The linear function $f(x)$ is used to define the function $g(x)$ as $g(x)=f(x)-3$. How is the graph of $g(x)$ related to the graph of $f(x)$?

4. The exponential function $f(x)$ is used to defined the function $g(x)$ as $g(x)=f(x)-3$. How is the graph of $g(x)$ related to the graph of $f(x)$?