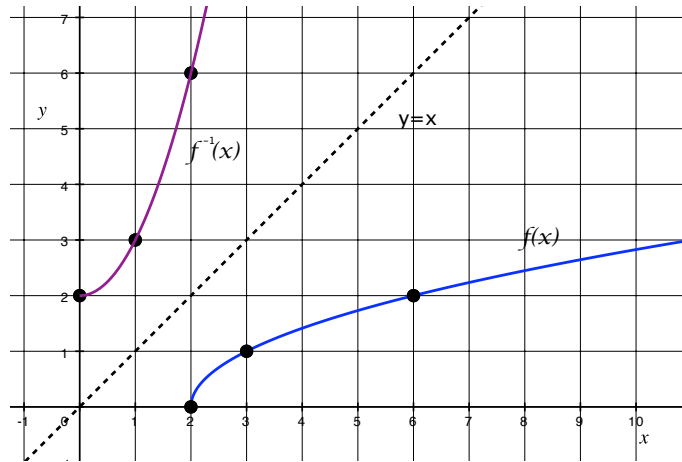
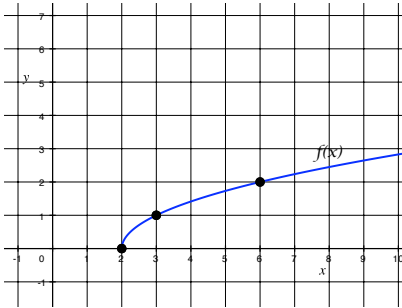


Math 98 Worksheet #9 Solutions

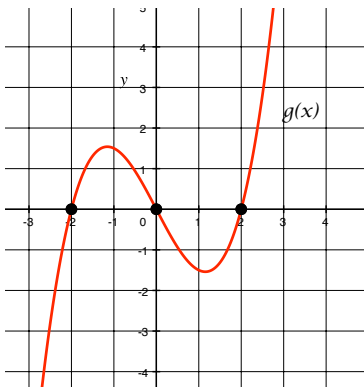
1. Determine if the following functions are one-to-one given the graphs below. If the function is one-to-one, sketch the inverse function. Include at least 2 points on the graph of the inverse function.

(a)



The graph $f(x)$ is one-to-one because it passes the horizontal line test and $f^{-1}(x)$ is shown above.

(b)



This function is not one-to-one. You can choose a horizontal line such as $y = 0$ and it will cross the graph of $g(x)$ more than once.

2. Find the inverse functions for the following functions.

(a) $f(x) = 3x - 6$

We have $y = 3x - 6$.

Switching x and y : $x = 3y - 6$

Solving for y : $x + 6 = 3y$

$$\Rightarrow y = \frac{x+6}{3} = \frac{1}{3}x + 2$$

So, $f^{-1}(x) = \frac{1}{3}x + 2$.

(b) $g(x) = \sqrt[3]{x+1}$.

We have $y = \sqrt[3]{x+1}$

Switching x and y : $x = \sqrt[3]{y+1}$

Solving for y : $x^3 = y + 1$

$$\Rightarrow y = x^3 - 1$$

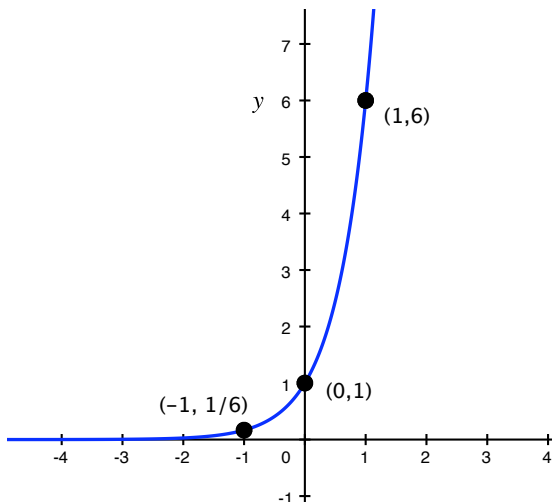
So, $g^{-1}(x) = x^3 - 1$.

3. If h is a one-to-one function and $h(2) = 7$, what is $h^{-1}(7) = ?$ What is $h^{-1}(h(9)) = ?$

By definition of the inverse function, $h^{-1}(7) = 2$ and $h^{-1}(h(9)) = 9$.

4. Graph the function $F(x) = 6^x$. What is the domain and range?

x	$y = 6^x$
-2	$6^{-2} = \frac{1}{36}$
-1	$6^{-1} = \frac{1}{6}$
0	$6^0 = 1$
1	$6^1 = 6$
2	$6^2 = 36$



Domain: $(-\infty, \infty)$

Range: $(0, \infty)$