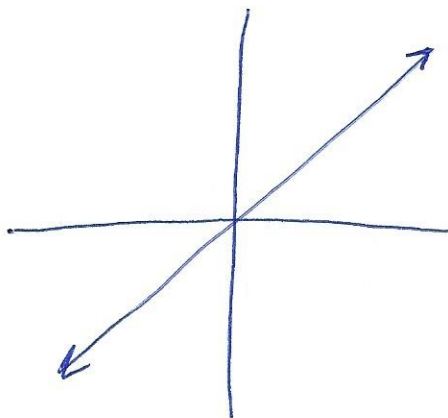
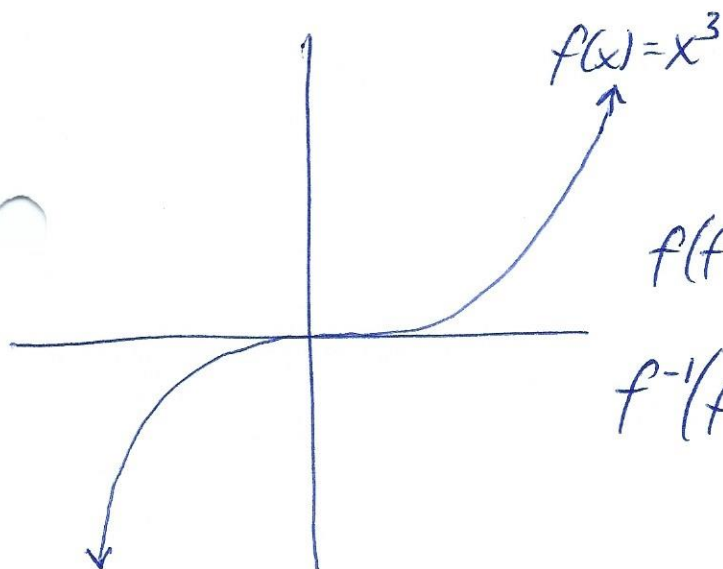


1/24/19

$f(x) = x$



Ex: $f(x) = x^3$

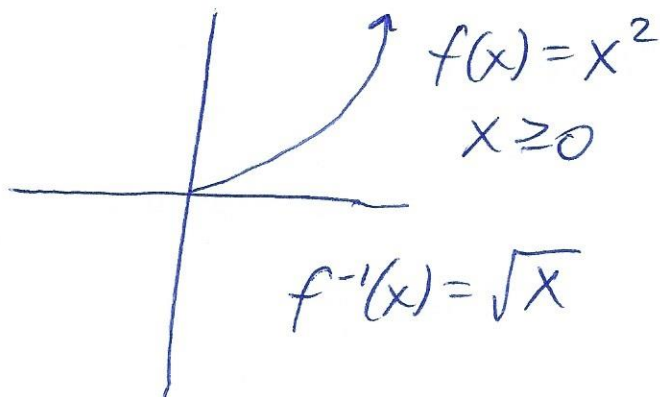


$f^{-1}(x) = x^{1/3}$

$f(f^{-1}(x)) = (x^{1/3})^3 = x$

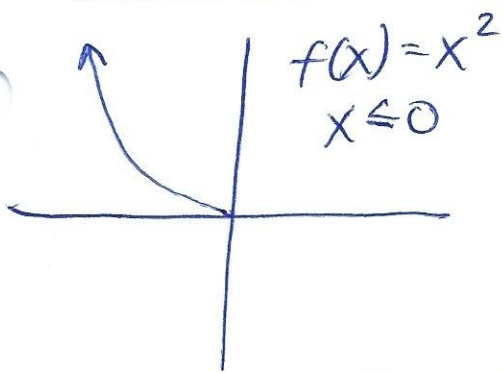
$f^{-1}(f(x)) = (x^3)^{1/3} = x$

Ex: $f(x) = x^2$, find $f^{-1}(x)$



$f^{-1}(x) = \sqrt{x}$

1/24/19



$$f^{-1}(x) = -\sqrt{x}$$

Ex: Find the inverse of:

a) $f(x) = 2x - 5$

b) $g(x) = \frac{1}{x-3}$

Answers:

a) $y = 2x - 5$, put "y" for "f(x)"

Now, swap "x" with "y".

$$x = 2y - 5$$

Solve for y: $y = \frac{x+5}{2} = f^{-1}(x)$

b) $y = \frac{1}{x-3}$; after swapping x and y:

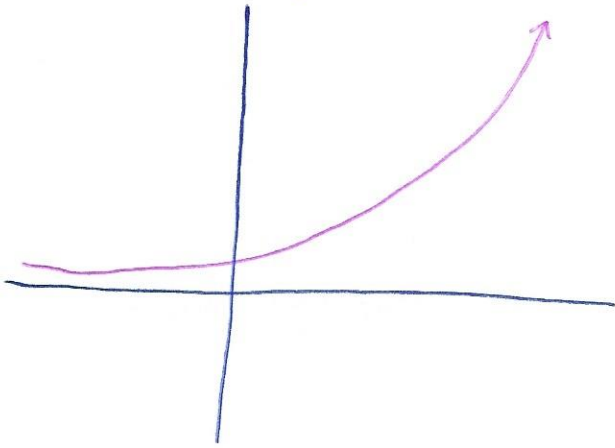
$$x = \frac{1}{y-3}, \quad y \neq 3$$

$$y-3 = \frac{1}{x}$$

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

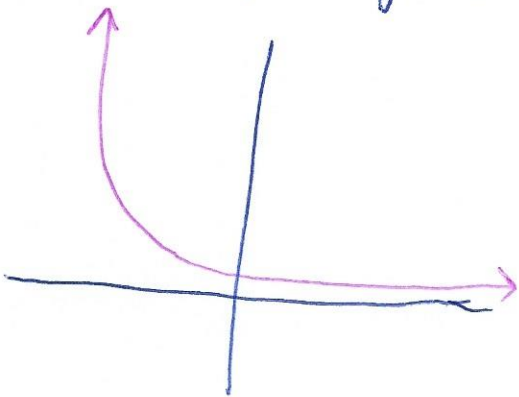
1/24/19

○ Ex: Graph $y = 2^x$



Horizontal asymptote: As $x \rightarrow -\infty$, $y \rightarrow 0$.

○ Ex: Graph $y = \left(\frac{1}{2}\right)^x = (2^{-1})^x = 2^{-x}$



Review: $x^a x^b = x^{a+b}$

$$\frac{x^a}{x^b} = x^{a-b}$$

$$x^0 = 1$$