**Precalculus – Inverses Day 2** Name:_____ Date:_____

For each function:

a) Find the inverse of each function.
b) Graph the function and its inverse.
c) Use interval notation and find the domain and range of the function and its inverse.

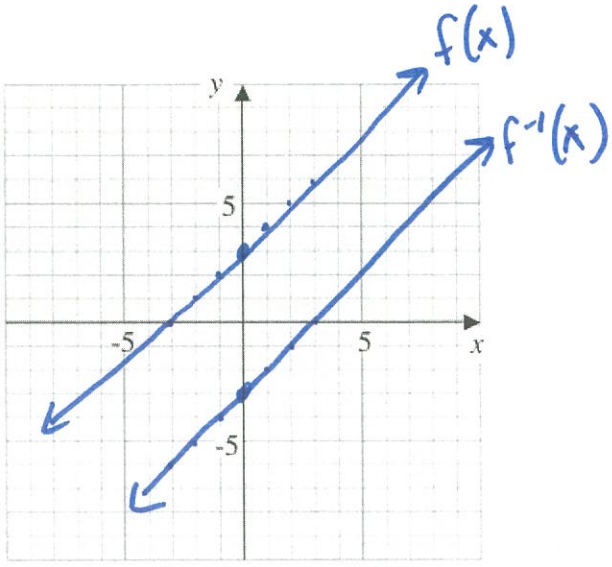
1. $f(x) = x + 3$

$y = x + 3$

$x = y + 3$

$x - 3 = y$

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




*Domain of* $f(x) =$ $\mathbb{R}$

*Domain of* $f^{-1}(x) =$ $\mathbb{R}$

2. $f(x) = x^3 + 2$

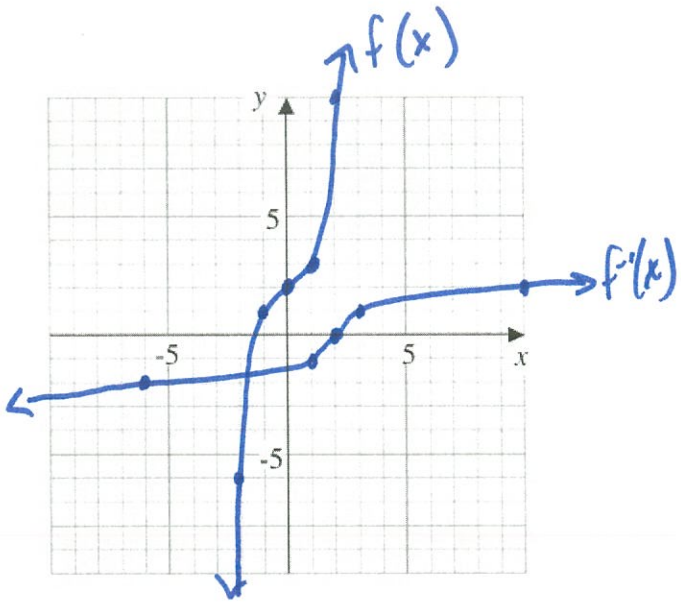
$y = x^3 + 2$

$x = y^3 + 2$

$x - 2 = y^3$

$\sqrt[3]{x-2} = y$

$f^{-1}(x) = \sqrt[3]{x-2}$

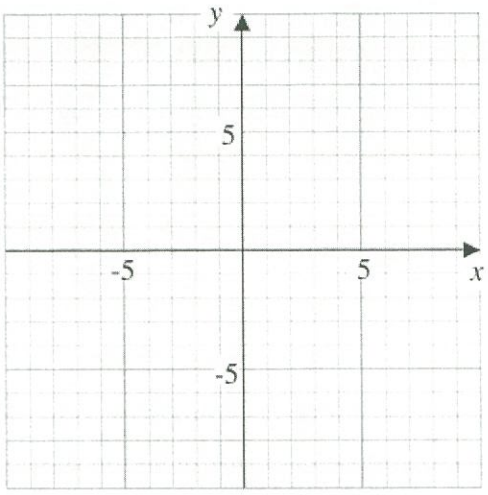



*Domain of* $f(x) =$ $\mathbb{R}$

*Domain of* $f^{-1}(x) =$ $\mathbb{R}$

3. $f(x) = x + 3$

Same as #1




*Domain of* $f(x) =$ _____

*Domain of* $f^{-1}(x) =$ _____

4. $f(x) = \sqrt[3]{x-1}$

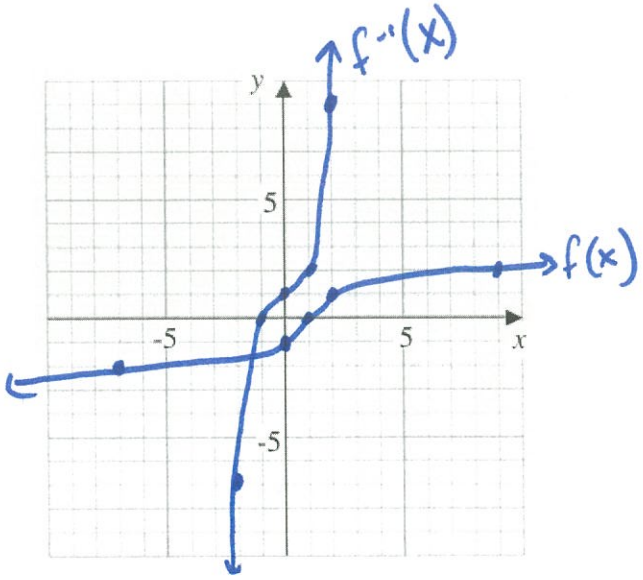
$y = \sqrt[3]{x-1}$

$x = \sqrt[3]{y-1}$

$x^3 = y - 1$

$x^3 + 1 = y$

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




*Domain of* $f(x) =$ $\mathbb{R}$

*Domain of* $f^{-1}(x) =$ $\mathbb{R}$

5. $f(x) = \frac{2x+1}{x-3}$ → $x-3 \neq 0$, $x \neq 3$

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

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

$x(y-3) = 2y+1$

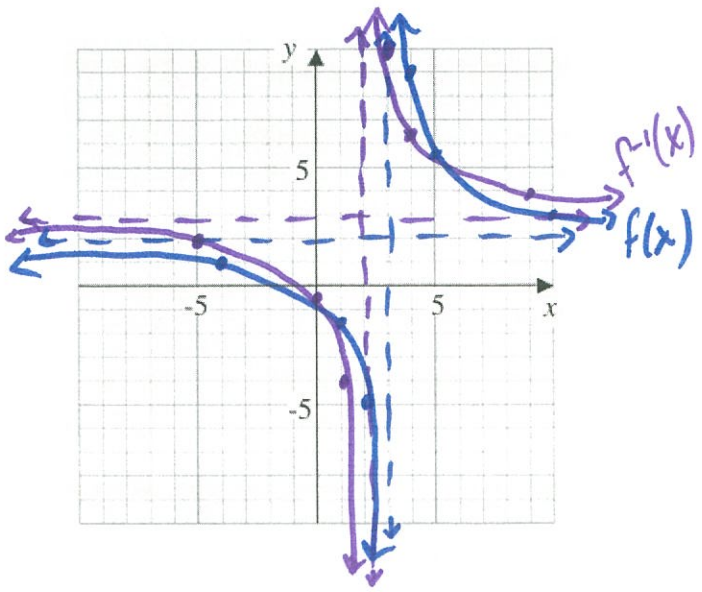
$xy - 3x = 2y+1$

$xy - 2y = 3x+1$

$y(x-2) = 3x+1$

$y = \frac{3x+1}{x-2}$ $\quad f^{-1}(x) = \frac{3x+1}{x-2}$

$x-2 \neq 0$, $x \neq 2$




Domain of $f(x) = (-\infty, 3) \cup (3, \infty)$

Domain of $f^{-1}(x) = (-\infty, 2) \cup (2, \infty)$

6. $f(x) = \frac{2x-3}{x+1}$ $\quad x+1 \neq 0$, $x \neq -1$

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

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

$x(y+1) = 2y-3$

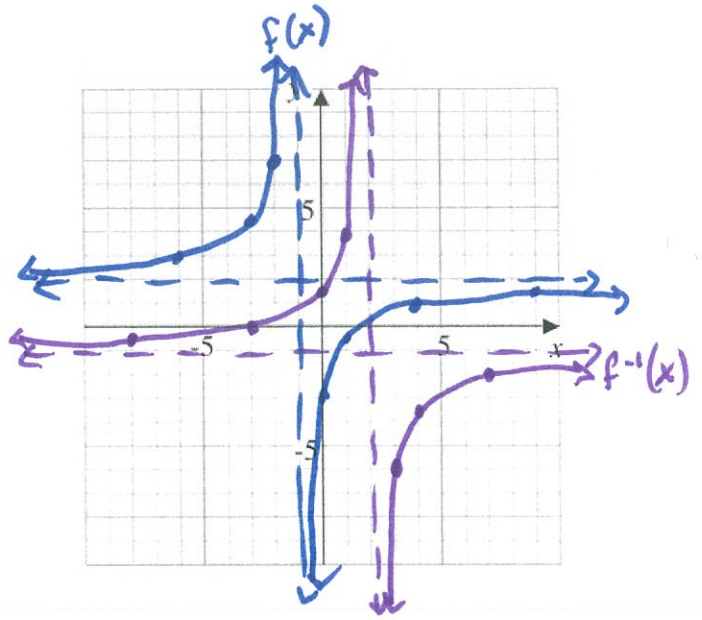
$xy + x = 2y-3$

$xy - 2x = -x-3$

$y(x-2) = -1(x+3)$

$y = \frac{-(x+3)}{x-2}$

$f^{-1}(x) = \frac{-(x+3)}{x-2}$ $\quad x-2 \neq 0$, $x \neq 2$




Domain of $f(x) = (-\infty, -1) \cup (-1, \infty)$

Domain of $f^{-1}(x) = (-\infty, 2) \cup (2, \infty)$