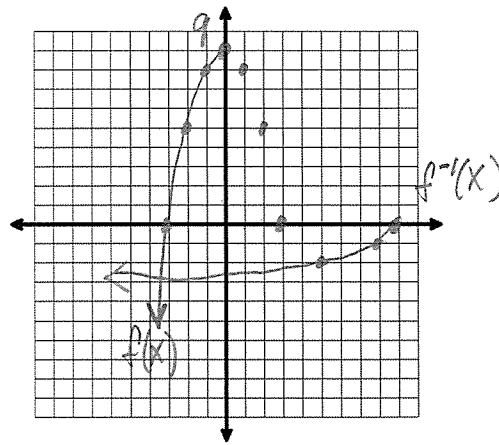
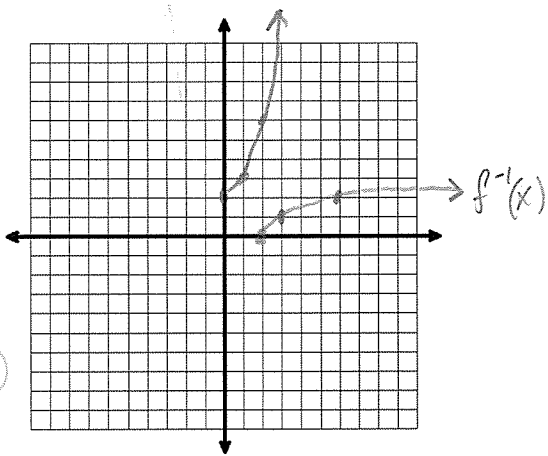


Advanced Algebra II Honors: Inverse Functions Day 2 - Homework

Given $f(x)$, find $f^{-1}(x)$. Find the domain and range of $f(x)$ and $f^{-1}(x)$. Graph $f(x)$ and $f^{-1}(x)$. In problems with a_{in} , the domain of $f(x)$ is given. If it is not given, you must find it first.

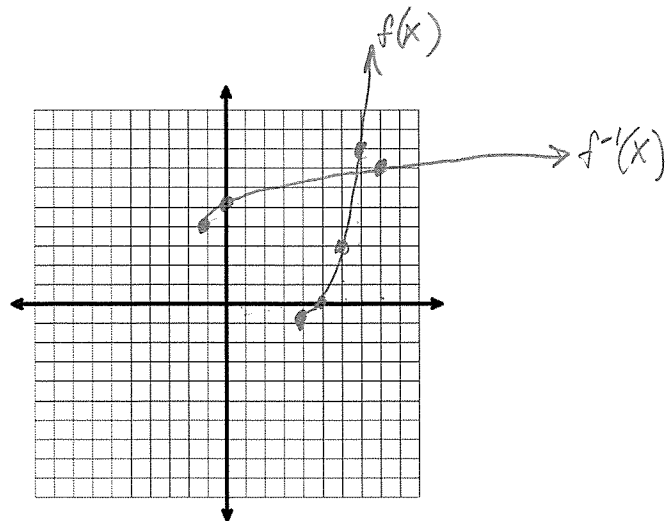
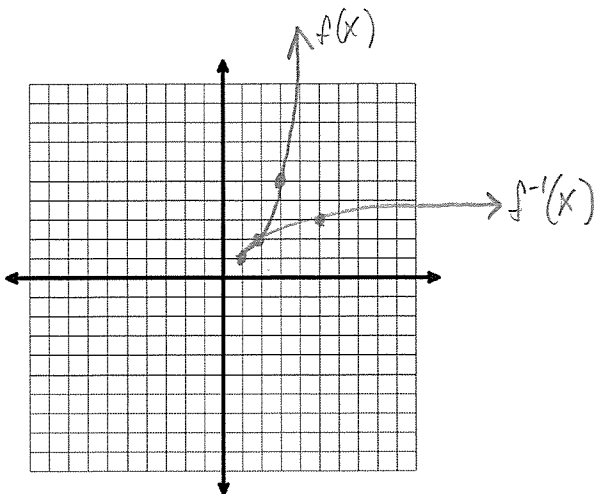
1. $f(x) = x^2 + 2$ $y = x^2 + 2$ $f^{-1}(x) = \sqrt{x-2}$
 vertex $(0, 2)$ $x = y^2 + 2$ $D: [2, \infty)$
 $D: [0, \infty)$ $x - 2 = y^2$ $R: [0, \infty)$
 $R: [2, \infty)$ $\pm\sqrt{x-2} = y$
 vertex $(2, 0)$

*2. $f(x) = 9 - x^2$, $x \leq 0$ vertex $(0, 9)$
 vertex $(0, 9)$ $y = 9 - x^2$ vertex $(9, 0)$
 $R: [0, \infty)$ $x = 9 - y^2$ $f^{-1}(x) = -\sqrt{9-x}$
 $y^2 = 9 - x$ $D: (-\infty, 9]$
 $y = \pm\sqrt{9-x}$ $R: (-\infty, 0]$



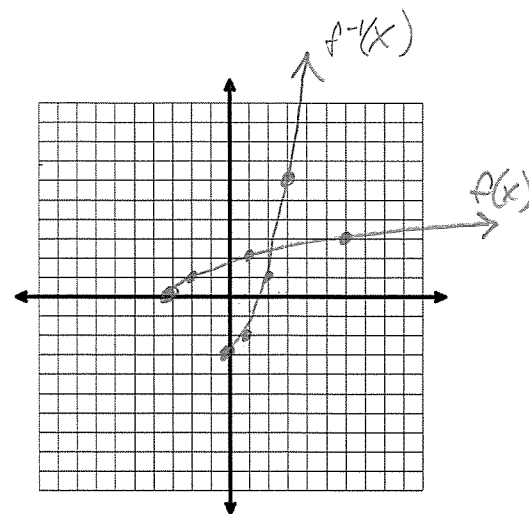
3. $f(x) = (x-1)^2 + 1$ $y = (x-1)^2 + 1$
 vertex $(1, 1)$ $x = (y-1)^2 + 1$
 $D: [1, \infty)$ $x - 1 = (y-1)^2$ $f^{-1}(x) = 1 + \sqrt{x-1}$
 $R: [1, \infty)$ $\pm\sqrt{x-1} = y-1$ $D: [1, \infty)$
 $1 \pm \sqrt{x-1} = y$ vertex $(1, 1)$ $R: [1, \infty)$

*4. $f(x) = (x-4)^2 - 1$, $x \geq 4$ vertex $(4, -1)$ $f^{-1}(x) = 4 + \sqrt{x+1}$
 vertex $(4, -1)$ $y = (x-4)^2 - 1$ vertex $(-1, 4)$
 $D: [4, \infty)$ $x = (y-4)^2 - 1$
 $R: [-1, \infty)$ $\pm\sqrt{x+1} = y-4$ $D: [-1, \infty)$
 $4 \pm \sqrt{x+1} = y$ $R: [4, \infty)$



○

5. $f(x) = \sqrt{x+3}$ $x = \sqrt{y+3}$
 vertex $(-3, 0)$ $x^2 = y+3$
 $D: [-3, \infty)$ $x^2 - 3 = y$
 $R: [0, \infty)$ vertex $(0, -3)$
 $f^{-1}(x) = x^2 - 3, x \geq 0$
 $D: [0, \infty)$
 $R: [-3, \infty)$



II. Find the inverse of each relation

1. $x^2 + y^2 = 9$
 $y^2 + x^2 = 9$

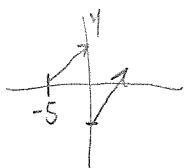
2. $\{(9,5), (6, -2), (8,11), (12, -2)\}$
 $\{(5,9), (-3,6), (11,8), (-2,12)\}$

3. $9x^2 + 9y^2 = 5$
 $9y^2 + 9x^2 = 5$

○

4. $f(x) = |x+5|, x \geq -5$
 $x = |y+5|, y \geq -5$

5. $f(x) = |x-3|, x \leq 3$
 $x = |y-3|, y \leq 3$



FUNCTIONS FOREVER!!!

You have a coupon for \$20 off the price of a new snowboard. When you arrive at the store, you find that because of all the rain, the price of all snowboards has been reduced by 15%. Use function notation to describe the cost with your coupon and the cost with the 15% discount. Would you pay less for the snowboard if you used your coupon after the 15% discount? Explain.

let $x =$ the price, original

$C(x) = x - 20$
 $D(x) = .85x$

$C(D(x)) = x - 20$
 $= .85x - 20$

$D(C(x)) = .85x$
 $= .85(x - 20)$
 $= .85x - 17$

○

Yes, it would cost less if the coupon is used after the 15% discount.