3.6 day 2 hw

Wednesday, November 6, 2013 7:20 AM

pg. 249 47, 51, 52, 57, 61, 65, 70, 71

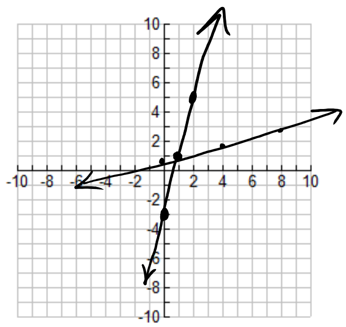
47. $f(x)=4x-3$

$y=4x-3$

$x=4y-3$

$x+3=4y$

$f^{-1}(x)=\frac{x}{4}+\frac{3}{4}$



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

Range of f: $(-\infty,\infty)$

Domain of f^{-1}: $(-\infty,\infty)$

Range of f^{-1}: $(-\infty,\infty)$

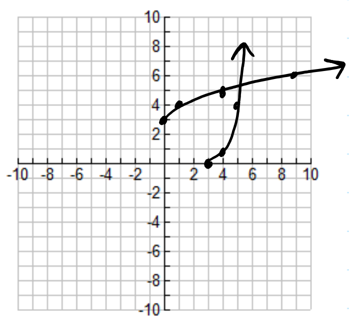
51. $f(x)=\sqrt{x}+3$

$y=\sqrt{x}+3$

$x=\sqrt{y}+3$

$x-3=\sqrt{y}$

$f^{-1}(x)=(x-3)^2$



Domain of f: $[0,\infty)$

Range of f: $[3,\infty)$

Domain of f^{-1}: $[3,\infty)$

Range of f^{-1}: $[0,\infty)$

52. $f(x)=2-\sqrt{x}$ $=-\sqrt{x}+2$

$y=2-\sqrt{x}$

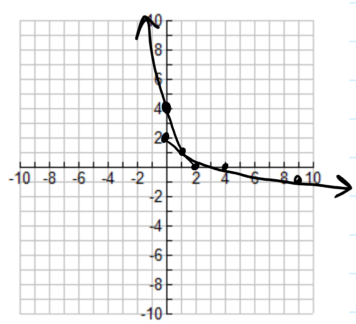
$x=2-\sqrt{y}$

$x-2=-\sqrt{y}$

$-x+2=\sqrt{y}$

$(-x+2)^2=y$

$f^{-1}(x)=(-x+2)^2$



Domain of f: $[0,\infty)$

Range of f: $(-\infty,2]$

Domain of f^{-1}: $(-\infty,2]$

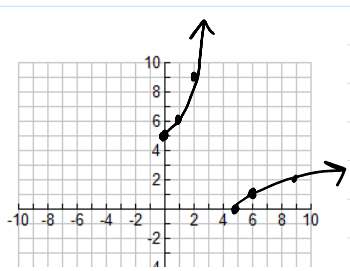
Range of f^{-1}: $[0,\infty)$

57. $f(x)=x^2+5,\ x\geq 0$

$y=x^2+5$

$x=y^2+5$

$x-5=y^2$



Domain of f: $[0,\infty)$

Range of f: $[5,\infty)$

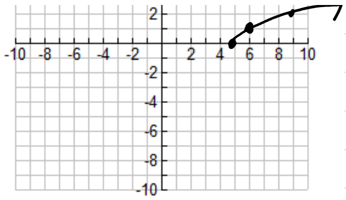
Domain of f^{-1}: $[5,\infty)$

Range of f^{-1}: $[0,\infty)$

$x-5=y^2$

$f^{-1}(x)=+\sqrt{x-5}$

because of original domain



Range of f^{-1}: $[0,\infty)$

61. $f(x)=x^2+8x, \quad x\geq -4$

$y=x^2+8x$

$x=y^2+8y$

$x+16=y^2+8y+16$

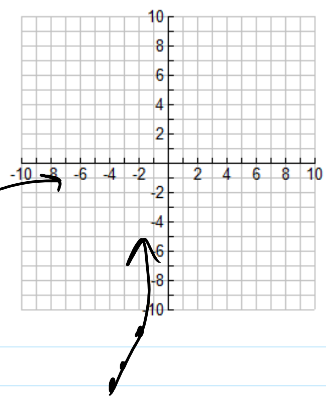
$x+16=(y+4)^2$

$\pm\sqrt{x+16}=y+4$

$-4\pm\sqrt{x+16}=y$

$f^{-1}(x)=+\sqrt{x+16}-4$

domain restriction w/ original



Domain of f: $[-4,\infty)$

Range f: $[-16,\infty)$

Domain of f^{-1}: $[-16,\infty)$

Range f^{-1}: $[-4,\infty)$

65. $f(x)=(x-1)^2+2, \quad x\geq 1$

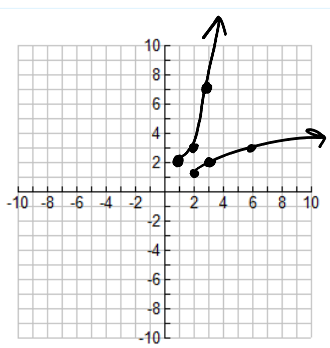
$y=(x-1)^2+2$

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

$x-2=(y-1)^2$

$f^{-1}(x)=\sqrt{x-2}+1$

(+) because of original domain



Domain of f: $[1,\infty)$

Range of f: $[2,\infty)$

Domain of f^{-1}: $[2,\infty)$

Range of f^{-1}: $[1,\infty)$

70. $f(x)=\sqrt{9-x^2}, \quad 0\leq x\leq 3$

$y=\sqrt{9-x^2}$

Domain of f: $[0,3]$

70. $f(x) = \sqrt{9-x^2}$, $0 \le x \le 3$

$y = \sqrt{9-x^2}$

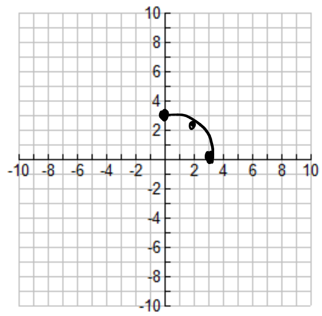
$x = \sqrt{9-y^2}$

$x^2 = 9 - y^2$

$x^2 - 9 = -y^2$

$f^{-1}(x) = \sqrt{9-x^2}$

only $+$ because of original domain



Domain of f: $[0,3]$

Range of f: $[0,3]$

Domain of f^{-1}: $[0,3]$

Range of f^{-1}: $[0,3]$

WHOA! A function can be its own inverse!

71. $f(x) = -\sqrt{9-x^2}$, $-3 \le x \le 0$

$y = -\sqrt{9-x^2}$

$x = -\sqrt{9-y^2}$

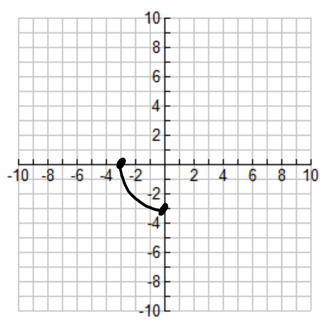
$-x = \sqrt{9-y^2}$

$x^2 = 9 - y^2$

$y^2 = 9 - x^2$

$f^{-1}(x) = -\sqrt{9-x^2}$

$-$ because of original domain



Domain of f: $[-3,0]$

Range of f: $[-3,0]$

Domain of f^{-1}: $[-3,0]$

Range of f^{-1}: $[-3,0]$