5. Yes.

6. No.

7. No.

8. Yes.

9. Yes.

if f(x_1)=f(x_2)
$\frac{1}{2}(x_1+5)=\frac{1}{2}(x_2+5)$⇒$x_1=x_2$

10. No.

f(0)=1=f(4)

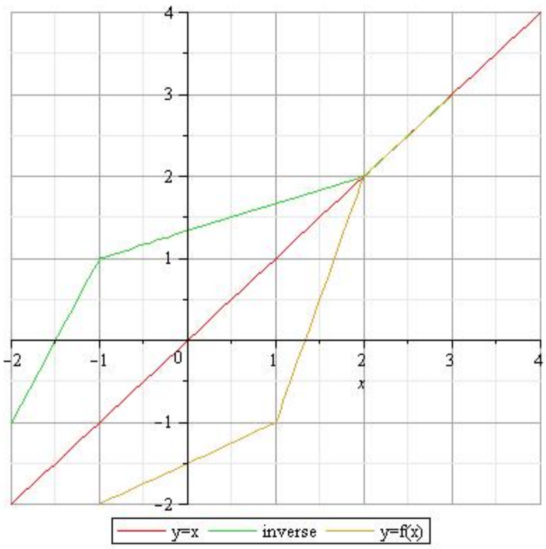
11. No.

g(1)=1=g(-1)

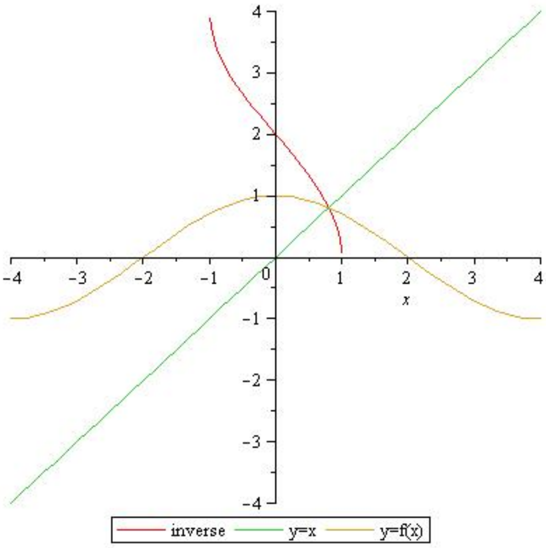
12. Yes.

if $\sqrt{x_1}=\sqrt{x_2}$ then $x_1=\sqrt{x_1}^2=\sqrt{x_2}^2=x_2$

29.



30.



53. domain of f : $(-\infty, \frac{1}{2}ln3]$; $f^{-1}(x) = \frac{1}{2}ln(3-x^2)$; domain of f^{-1}: $[0, \sqrt{3})$

$0 \leq 3 - e^{2x} \Longrightarrow e^{2x} \leq 3 \Longrightarrow$ x $\leq \frac{1}{2}ln3$
if y $= \sqrt{3-e^{2x}}$ then $0 \leq$ y $= \sqrt{3-e^{2x}} < \sqrt{3-0} = \sqrt{3}$, and $x = \frac{1}{2}ln(3-y^2)$

54. domain of f : (e^{-2}, ∞) ; $f^{-1}(x) = e^{(e^x-2)}$; domain of f^{-1}: $(-\infty, \infty)$

$x > 0$ and $2 + ln(x) > 0 \Longrightarrow x > e^{-2}$
if y $= ln(2 + ln(x))$ then because the range of $2 + ln(x)$ is $(0, \infty)$,
the range of y is $(-\infty, \infty)$ and $x = e^{(e^y-2)}$

58. (a) $t = -aln(1 - \frac{Q}{Q_0})$, the speed of recharging depends on a

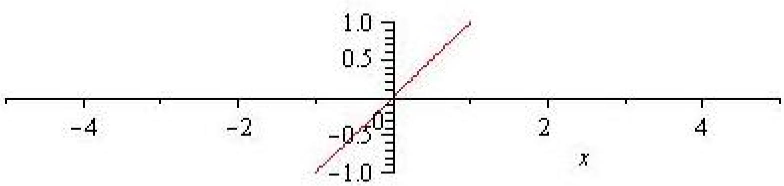
(b) $-aln(1 - \frac{Q}{Q_0}) = -2ln(1-0.9) = -2ln(0.1) \approx 4.60517$

71. domain : $[-\frac{2}{3}, 0]$; range : $[-\frac{\pi}{2}, \frac{\pi}{2}]$

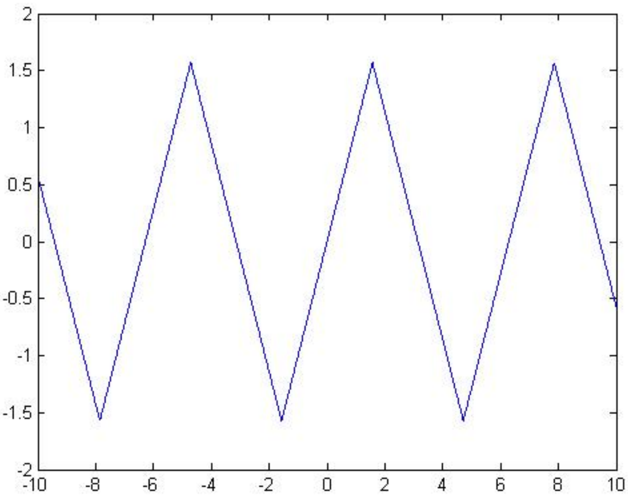
$-1 \leq 3x + 1 \leq 1 \Longrightarrow -\frac{2}{3} \leq x \leq 0$

72.

(a)



(b)



The deference between (a) and (b) is the domain,
even through their behavior is the same on $[-1, 1]$.