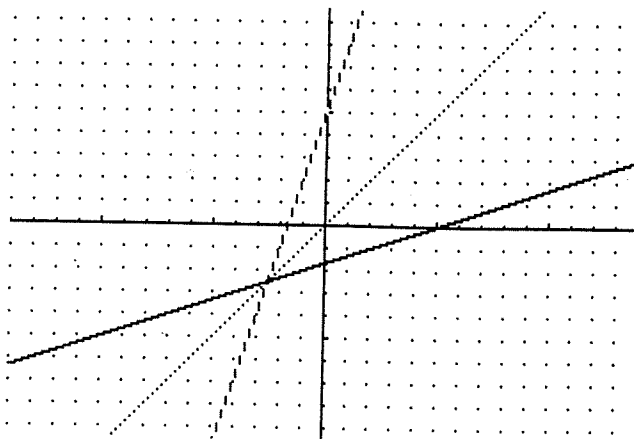


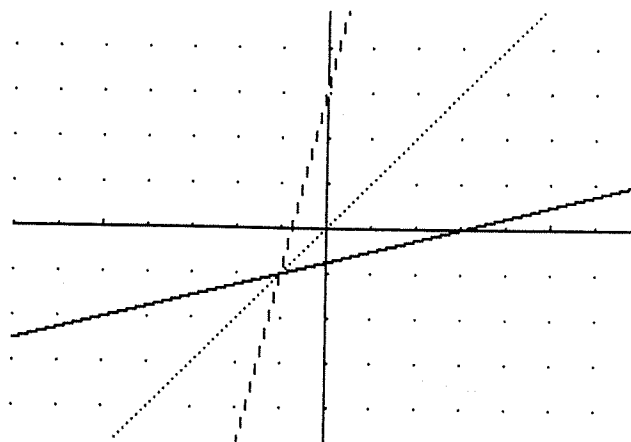
1. a. $f(x) = 3x + 5 \rightarrow f^{-1}(x) = \frac{1}{3}x - \frac{5}{3}$

- b. Graph.
c. Function.



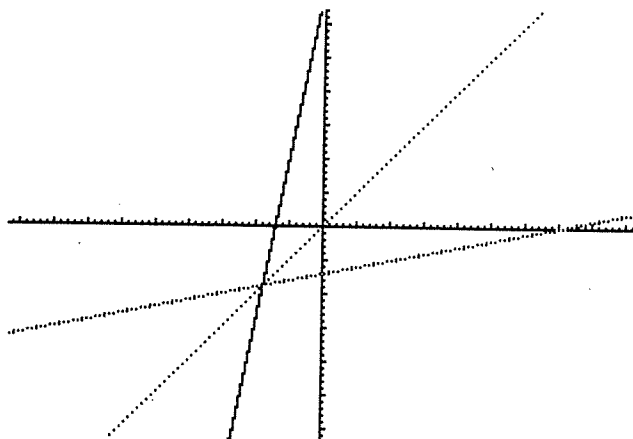
4. a. $f(x) = 4x + 3 \rightarrow f^{-1}(x) = 0.25x - 0.75$

- b. Graph.
c. Function.



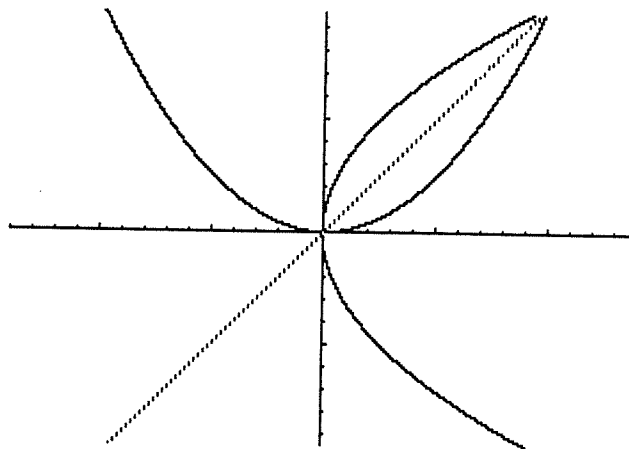
2. a. $f(x) = 0.2x - 7 \rightarrow f^{-1}(x) = 5x + 35$

- b. Graph.
c. Function.



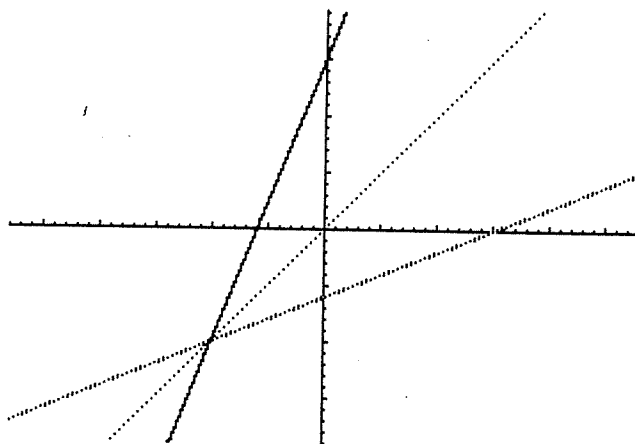
5. a. $f(x) = 0.1x^2 \rightarrow f^{-1}(x) = \pm\sqrt{10x}$

- b. Graph.
c. Not a function.



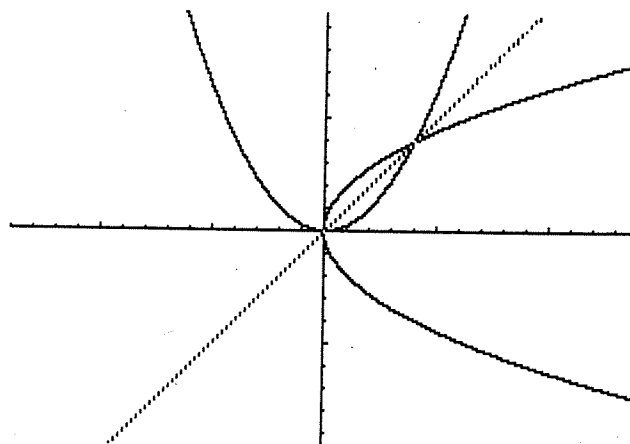
3. a. $f(x) = 0.4x - 6 \rightarrow f^{-1}(x) = 2.5x + 15$

- b. Graph.
c. Function.



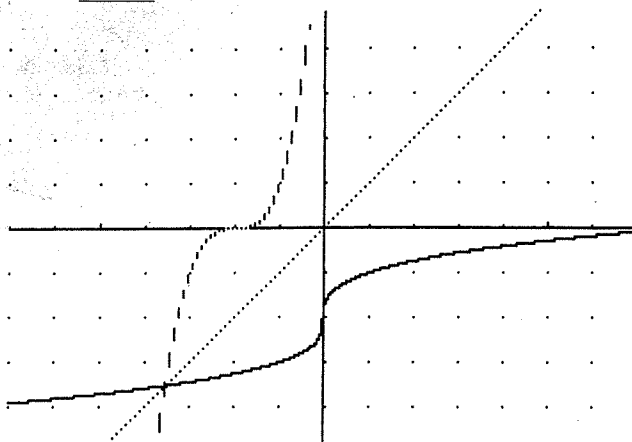
6. a. $f(x) = \frac{x^2}{4} \rightarrow f^{-1}(x) = \pm 2\sqrt{x}$

- b. Graph.
c. Not a function.



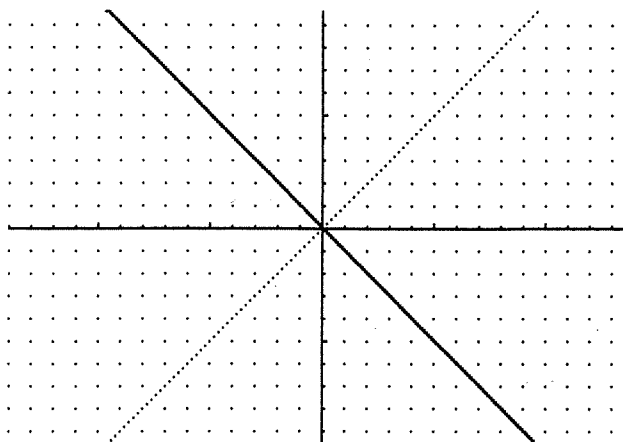
7. a. $f(x) = (x + 2)^3 \rightarrow f^{-1}(x) = \underline{x^{1/3} - 2}$

- b. Graph.
c. Function.



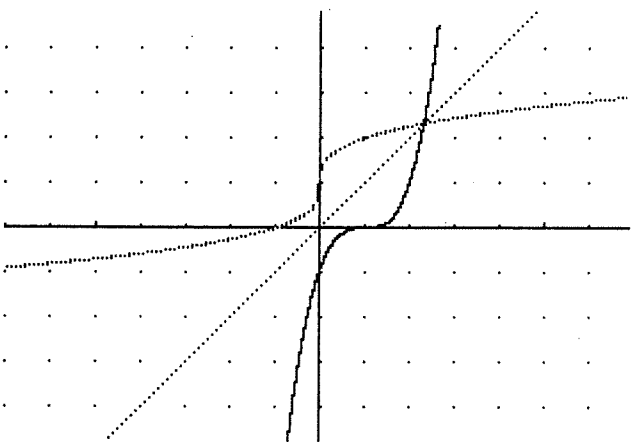
10. a. $f(x) = -x \rightarrow f^{-1}(x) = \underline{-x}$

- b. Graph.
c. Function.



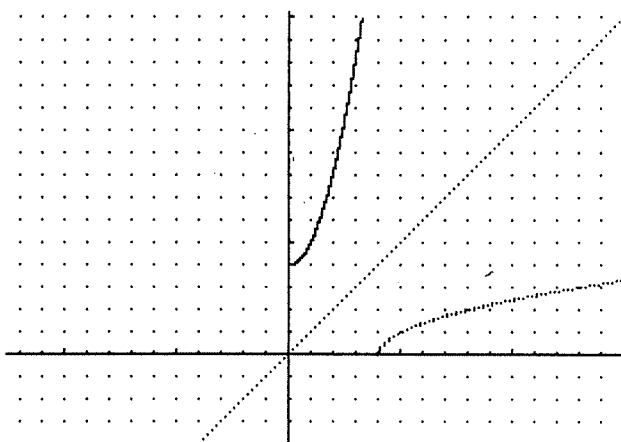
8. a. $f(x) = \sqrt[3]{x} \rightarrow f^{-1}(x) = \underline{(x - 1)^3}$

- b. Graph.
c. Function.



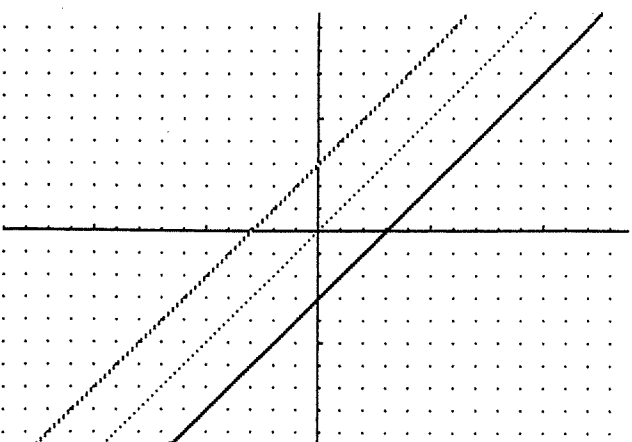
11. a. $f(x) = \sqrt{x - 4} \rightarrow f^{-1}(x) = \underline{x^2 + 4, x \geq 0}$

- b. Graph.
c. Function.



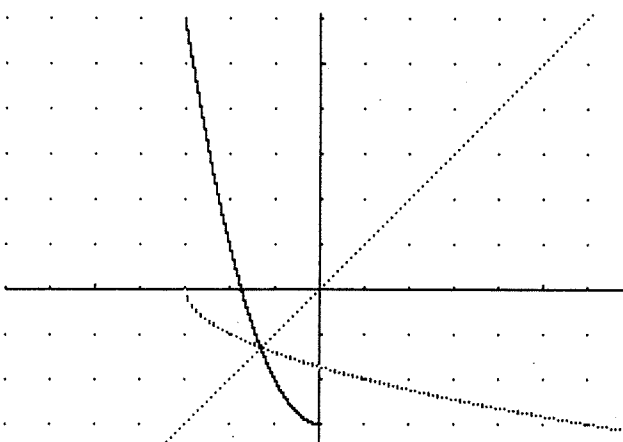
9. a. $f(x) = x + 3 \rightarrow f^{-1}(x) = \underline{x - 3}$

- b. Graph.
c. Function.

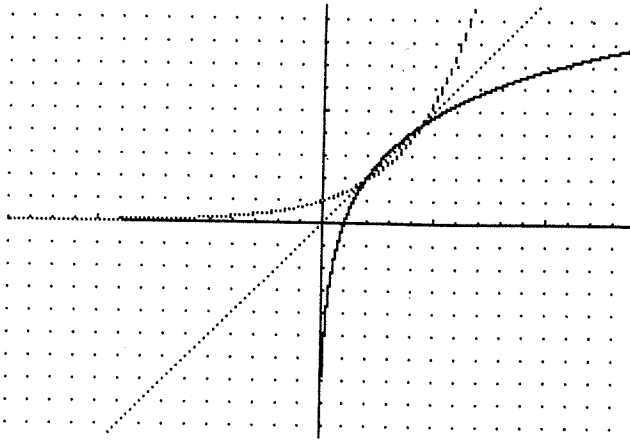


12. a. $f(x) = -\sqrt{x + 3} \rightarrow f^{-1}(x) = \underline{x^2 - 3, x \leq 0}$

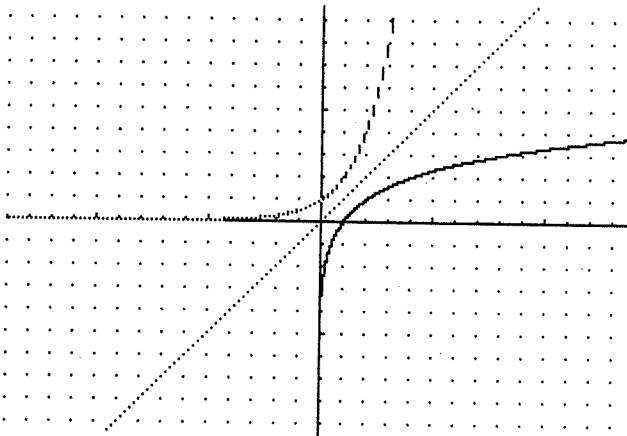
- b. Graph.
c. Function.



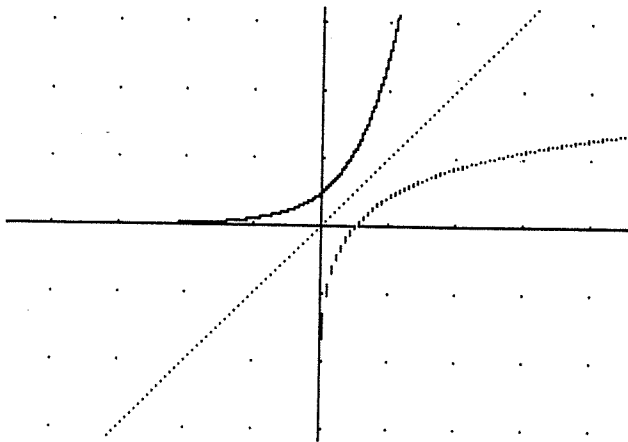
13. a. $f(x) = 1.4^x \rightarrow f^{-1}(x) = \log_{1.4} x$
 b. Graph.
 c. Function.



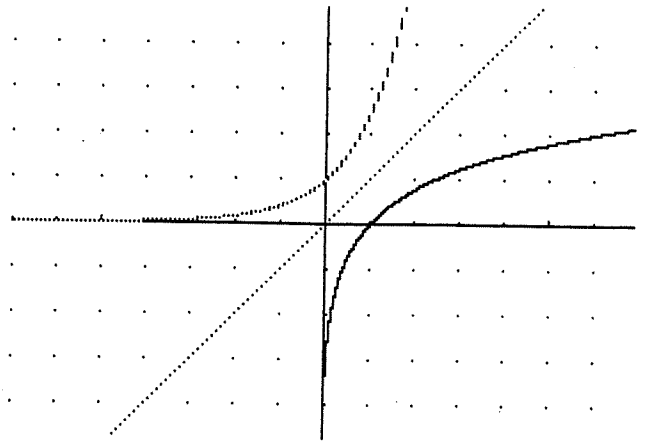
14. a. $f(x) = \log_2 x \rightarrow f^{-1}(x) = 2^x$
 b. Graph.
 c. Function.



15. a. $f(x) = \log_5(2x) \rightarrow f^{-1}(x) = (0.5)(5^x)$
 b. Graph.
 c. Function.



16. a. $g(x) = 6^{0.5x} \rightarrow f^{-1}(x) = 2 \log_6 x$
 b. Graph.
 c. Function.



17. Not inverses. 18. Inverses.
 19. Inverses. 20. Not inverses.

21. $f(x) = 2x; g(x) = \frac{x}{2}$

$$\therefore f(g(x)) = 2\left(\frac{x}{2}\right) = \underline{x}$$

Inverses.

22. $f(x) = (x + 5); g(x) = \frac{1}{(x + 5)}$

$$\therefore f(g(x)) = \left(\frac{1}{x+5} + 5\right) = \underline{\frac{5x+26}{x+5}}$$

Not inverses.

23. $f(x) = \frac{3}{x}; g(x) = \frac{x}{3}$

$$\therefore f(g(x)) = \frac{3}{\left(\frac{x}{3}\right)} = \underline{\frac{9}{x}}$$

Not inverses.

25. $f(x) = 3^x; g(x) = \log_3 x$
 $\therefore f(g(x)) = 3^{\log_3 x} = \underline{x}$
 Inverses.

24. $f(x) = \sqrt{x}; g(x) = x^2, x \geq 0$

$$\therefore f(g(x)) = \sqrt{x^2} = \underline{x},$$

since $x \geq 0$

Inverses.

26. $f(x) = x^5; g(x) = 5^x$
 $\therefore f(g(x)) = (5^x)^5 = \underline{5^{5x}}$
 Not inverses.

27. Let $f(x) = kx$ and $g(x) = \frac{x}{k}$ where $k \neq 0$.

$$\text{Then } f(g(x)) = k\left(\frac{x}{k}\right) = x.$$

$$\therefore g(x) = f^{-1}(x), \text{ Q.E.D.}$$

28. Let $f(x) = x - k$ and $g(x) = x + k$.

$$\text{Then } f(g(x)) = (x + k) - k = x.$$

$$\therefore g(x) = f^{-1}(x), \text{ Q.E.D.}$$

29. If $f(x) = k$, then the graph is a horizontal straight line. So the inverse relation has a graph that is a vertical line. So the inverse is *not a function*.

30. If $f(x) = x$, then $f^{-1}(x) = x$.

$$\text{If } f(x) = -x, \text{ then } f^{-1}(x) = -x.$$

$$\text{If } f(x) = \frac{1}{x}, \text{ then } f^{-1}(x) = \frac{1}{x}.$$

$$\text{If } f(x) = -\frac{1}{x}, \text{ then } f^{-1}(x) = -\frac{1}{x}.$$