1. **(a)** $f(g(x)) = 4(x/4) = x$, $g(f(x)) = (4x)/4 = x$, f and g are inverse functions

(b) $f(g(x)) = 3(3x-1)+1 = 9x-2 \neq x$ so f and g are not inverse functions

(c) $f(g(x)) = \sqrt[3]{(x^3+2)-2} = x$, $g(f(x)) = (x-2)+2 = x$, f and g are inverse functions

(d) $f(g(x)) = (x^{1/4})^4 = x$, $g(f(x)) = (x^4)^{1/4} = |x| \neq x$, f and g are not inverse functions

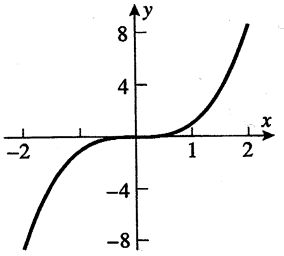
5. **(a)** yes; all outputs (the elements of row two) are distinct

(b) no; $f(1) = f(6)$

7. **(a)** f has an inverse because the graph passes the horizontal line test. To compute $f^{-1}(2)$ start at 2 on the y-axis and go to the curve and then down, so $f^{-1}(2) = 8$; similarly, $f^{-1}(-1) = -1$ and $f^{-1}(0) = 0$.

(b) domain of f^{-1} is $[-2, 2]$, range is $[-8, 8]$

(c)



8. **(a)** the horizontal line test fails

(b) $-3 < x \leq -1$; $-1 \leq x \leq 2$; and $2 \leq x < 4$.

24. **(a)** $C = \dfrac{5}{9}(F - 32)$

(b) how many degrees Celsius given the Fahrenheit temperature

(c) $C = -273.15°$ C is equivalent to $F = -459.67°$ F, so the domain is $F \geq -459.67$, the range is $C \geq -273.15$

27. **(a)** $f(f(x)) = \dfrac{3 - \dfrac{3-x}{1-x}}{1 - \dfrac{3-x}{1-x}} = \dfrac{3-3x-3+x}{1-x-3+x} = x$ so $f = f^{-1}$

(b) symmetric about the line $y = x$

29. if $f^{-1}(x) = 1$, then $x = f(1) = 2(1)^3 + 5(1) + 3 = 10$

30. if $f^{-1}(x) = 2$, then $x = f(2) = (2)^3/[(2)^2 + 1] = 8/5$