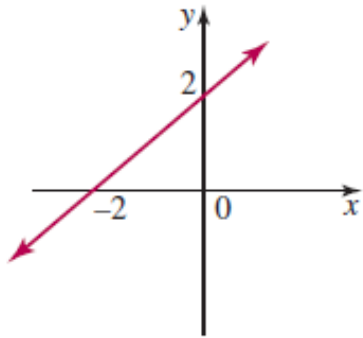


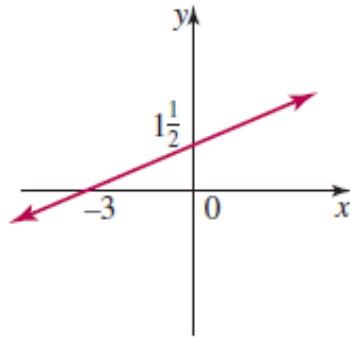
# INVERSE FUNCTIONS

1 Sketch the inverse relation for each of the following.

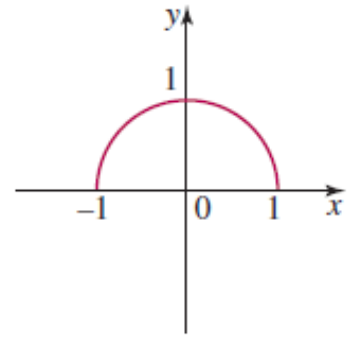
**a**



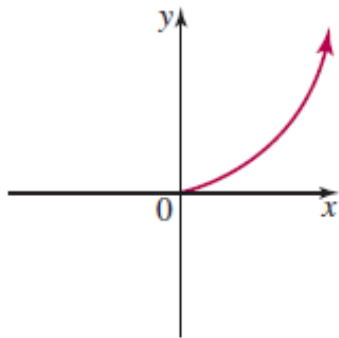
**b**



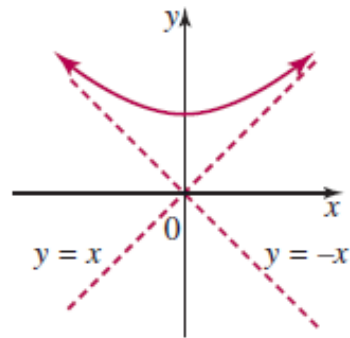
**c**



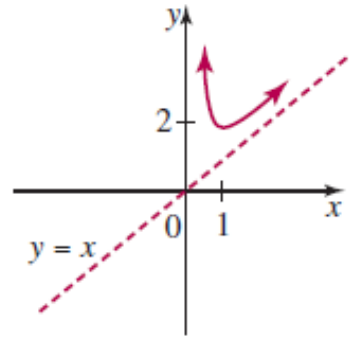
**d**



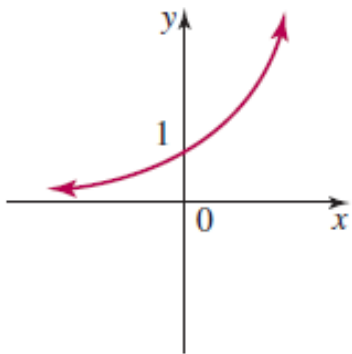
**e**



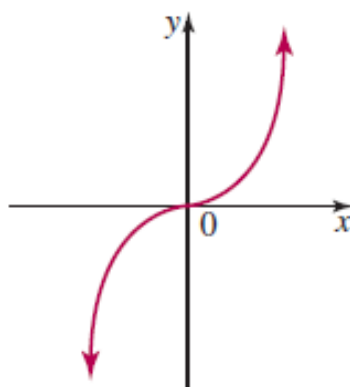
**f**



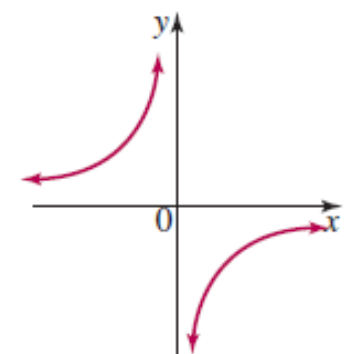
**g**



**h**



**i**



2 Which of the relations in question 1 have an inverse that is a function?

## INVERSE FUNCTIONS

10. Show that the functions  $f(x)$  and  $g(x)$  are inverses of each other by showing that  $f(g(x)) = x$  and  $g(f(x)) = x$

a) $f(x) = x + 7$ and $g(x) = x - 7$	b) $f(x) = 5x$ and $g(x) = \frac{x}{5}$
c) $f(x) = 2x + 2$ and $g(x) = \frac{x}{2} - 1$	d) $f(x) = x^3 + 1$ and $g(x) = \sqrt[3]{x - 1}$
e) $f(x) = \frac{1}{x+3}$ and $g(x) = \frac{1}{x} - 3$	f) $f(x) = \frac{x-1}{x+2}$ and $g(x) = \frac{2x+1}{1-x}$

4 Find the inverse function for each of the following functions. For each inverse, make  $y$  the subject.

a  $y = \frac{1}{x} - 2$

b  $y = \frac{1}{x-1}$

c  $y = \frac{x-3}{x+3}$

d  $y = \frac{2x}{5-x}$

## INVERSE FUNCTIONS

3 For each of the following, find the inverse function and state the domain and range of the inverse.

(a)  $f(x) = 2x - 4$

(b)  $f(x) = x^2 - 1, x \geq 0$

(c)  $g(x) = \sqrt{x-3}$

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

## INVERSE FUNCTIONS

6 Show that the following pairs of functions are inverses by showing that  $f(g(x)) = g(f(x)) = x$ .

(d)  $f(x) = 2x - x^2, x \geq 1$  and  $g(x) = 1 + \sqrt{1-x}, x \leq 1$

(e)  $f(x) = \frac{1}{2x-1}, x > \frac{1}{2}$  and  $g(x) = \frac{x+1}{2x}, x > 0$