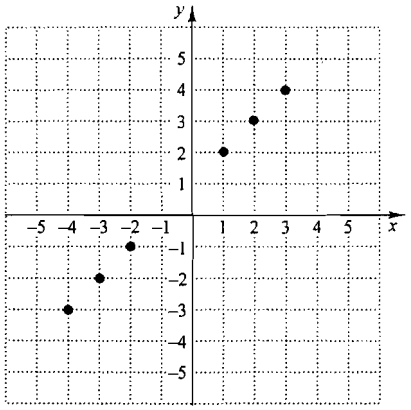
For each graph of a function, determine **(a)** f(1); **(b)** *the domain*; **(c)** *any x-values for which* f(x) = 2; and **(d)** *the range*.

12.



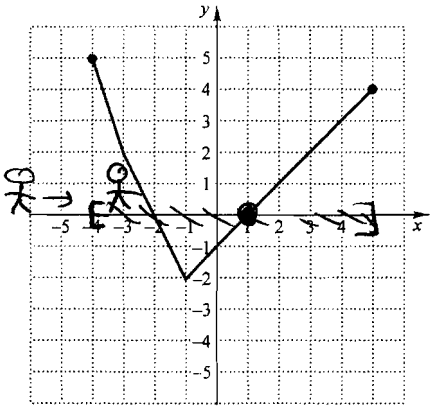
12. (a) $f(1) = 2$

(b) Domain = $\{-4, -3, -2, 1, 2, 3\}$ (x values)

(c) $f(x) = 2$ when $x = 1$

(d) Range = $\{-3, -2, -1, 2, 3, 4\}$

13.



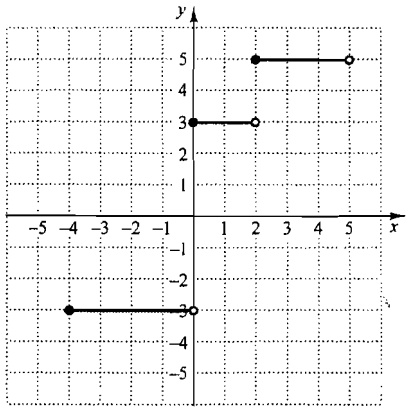
13.(a) $f(1) = 0$

(b) Domain: $\{x \mid -4 \leq x \leq 5\}$ OR $[-4, 5]$

(c) ~~$f(x) = 2$~~ when $x = 3$ and $x = 3$

(d) Range $\{y \mid -2 \leq y \leq 5\}$ OR $[-2, 5]$

14.



14. (a) $f(1) = 3$

(b) Domain $\{x \mid -4 \leq x < 5\}$ $[-4, 5)$

(c) None

(d) Range $\{-3, 3, 5\}$

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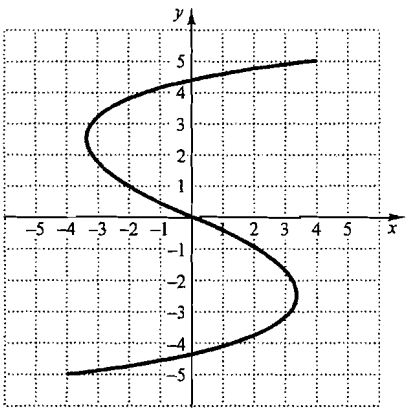
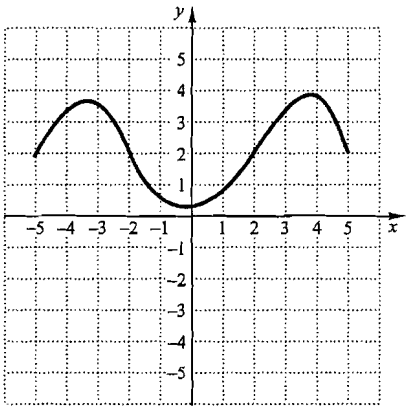
Determine whether each of the following is the graph of a function.

15.



15. NO
Because it fails the vertical line test

16.



16. Yes
Because it passes the vertical line test

Find the function values.

17. $f(x) = 5x - 3$

a) $f(1)$ **b)** $f(-3)$

c) $f(a-2)$ **d)** $f(a)-2$

17. (a) $f(1) = 2$

(b) $f(-3) = -18$

(c) $f(a-2) = 5(a-2)-3 = 5a-13$

(d) $f(a)-2 = 5a-3-2 = 5a-5$

18. $g(x) = \dfrac{2x+1}{x-3}$

a) $g(0)$ **b)** $g(-3)$

c) $g(4)$ **d)** $g(a+3)$

18. (a) $g(0) = -\frac{1}{3}$

(b) $g(-3) = \frac{-6+1}{-3-3} = \frac{-5}{-6} = \frac{5}{6}$

(c) $g(4) = \frac{9}{1} = 9$

(d) $g(a+3) = \frac{2(a+3)+1}{a+3-3} = \frac{2a+7}{a}$

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Use the given function to find the value indicated.

19. The function H described by $H(s) = s\sqrt{2}$ gives the length of the hypotenuse of an isosceles right triangle with legs of length s. Find the length of the hypotenuse of an isosceles right triangle if the legs are 5 in. long.

19. _____

$H(5) = 5\sqrt{2}$ inches
≈ 7.07 inches

20. The function V described by $V(r) = \frac{4}{3}\pi r^3$ gives the volume of a sphere with radius r. Find the volume when the radius is 3 cm.

20. _____

$V(3) = \frac{4}{3}\pi(3)^3$
$= 36\pi$ cm^3

Give the missing value.

21. $f(x) = 4 - 2x$

x	$f(x)$
6	

21. when $x = 6$
$f(6) = 4 - 2(6) = 4 - 12$
$= -8$

22. $f(x) = 4 - 2x$

x	$f(x)$
	-12

$4 - 2x = -12$
$-2x = -16$
$x = 8$

22. $x = 8$

23. If $f(x) = 3x - 7$, for what input is the output 0?

23. _____

$0 = 3x - 7 \Rightarrow 3x = 7$ $x = \frac{7}{3}$

24. If $f(x) = 0.3x + 2.1$, for what input is the output -6?

24. _____

$-6 = 0.3x + 2.1$
$-8.1 = 0.3x \Rightarrow x = \frac{-8.1}{0.3} = -27$

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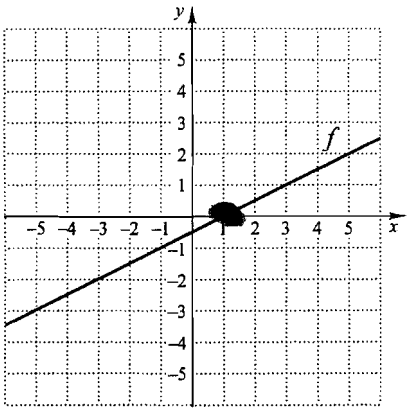
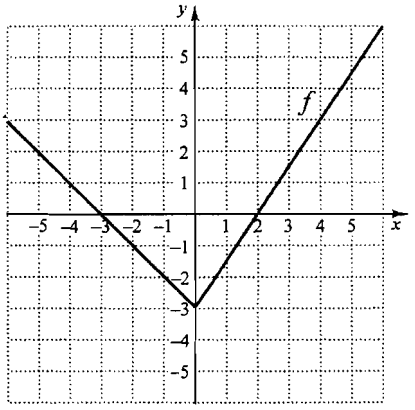
In Exercises 25–28, determine the zeros, if any, of each function.

25. **25.**_____



Zero of the function means y value is zero this occurs when $x=1$

26. **26.**_____



Zeros of the function means y value is zero this occurs when $x=-3$ and $x=2$

27. $f(x)=6-x$ **27.**_____

$0=6-x \Rightarrow x=6$

28. $f(x)=5x+3$ **28.**_____

$0=5x+3$

$5x=-3$

$x=\frac{-3}{5}$