

Evaluate each function.

- 1) $w(n) = |n - 3|$; Find $w(-7) = |-7-3| = |-10| = 10$ 2) $k(n) = 3|-n+3| + 2$; Find $k(-9)$
 $3|-1(-9)+3|+2$
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- 3) $w(t) = t^2 - 2t$; Find $w(-2) = 8$ 4) $w(n) = 2n + 1$; Find $w(-n)$
 $-2n+1$
- 5) $k(x) = 4x$; Find $k(x^2) = 4x^2$ 6) $g(x) = 3x + 4$; Find $g(4x)$
 $12x+4$

Perform the indicated operation.

- 7) $g(n) = 4n - 3$
 $h(n) = n^2 + 2$
 Find $(g+h)(n)$ n^2+4n-1
- 8) $g(x) = 3x + 2$
 $f(x) = 2x - 2$
 Find $(g-f)(x)$ $3x+2-(2x-2)$
 $3x+2-2x+2$
 $x+4$
- 9) $g(x) = -4x$
 $h(x) = x^2 + 5$
 Find $(g \circ h)(x)$ $-4x^2-20$
- 10) $g(a) = a^3 - 3a$
 $f(a) = 2a - 5$
 Find $(g \cdot f)(1)$ 6
- 11) $f(x) = x^3 - 4x$
 $g(x) = -2x + 5$
 Find $(f+g)(1)$ 0
- 12) $g(n) = n^2 + 1$
 $f(n) = 3n + 2$
 Find $(g \circ f)(-1)$ $(3n+2)^2+1$
 $(3(-1)+2)^2+1=2$
- 13) $g(n) = 3n$
 $h(n) = n^3 - 2$
 Find $(g-h)(2)$ 0
- 14) $f(x) = x^3 - 5x$
 $g(x) = 4x + 1$
 Find $(\frac{f}{g})(-4)$ $\frac{x^3-5x}{4x+1} = \frac{(-4)^3-5(-4)}{4(-4)+1}$
 $= \frac{44}{15}$
- 15) $g(a) = 3a + 1$
 $h(a) = -2a^3 - 4a$
 Find $(g-h)(1)$ $3a+1-(-2a^3-4a)$
 $3a+1+2a^3+4a$
 $= 10$
 $3+1+2+4$
- 16) $f(x) = 2x + 4$
 $g(x) = x + 1$
 Find $(f \circ g)(-2x)$ $-4x+6$
- 17) $f(t) = t^2 - 3$
 $g(t) = 2t - 5$
 Find $(f \cdot g)(t+3)$ $2(t+3)^3 - 5(t+3)^2 - 6(t+3) + 15$
 $= 2t^3 + 13t^2 + 18t + 6$
 $(t^2-3)(2t-5)$
 $2t^3 - 5t^2 - 6t + 15$
- 18) $g(t) = 2t - 3$
 $h(t) = 3t - 1$
 Find $(g \circ h)(t-4)$ $6t-29$

Find the inverse of each function.

- 19) $g(x) = \sqrt[5]{x} - 3$
 $f(x) = y$
 $g(x) = y$
 $x \leftrightarrow y$
 solve for new y:
 $g^{-1} = (x+3)^5$
- 20) $f(x) = 1 + (x-1)^3$
 $g^{-1} = \sqrt[3]{x-1} + 1$

21) $h(x) = \frac{2}{x+2}$ $\frac{x}{1} = \frac{2}{y+2}$ $x(y+2) = 2$
 $(xy) + 2x = 2$ $f(x) = x - 5$
 $xy = 2 - 2x$
 $h^{-1} = \frac{2-2x}{x} = \frac{2}{x} - 2$ $f^{-1} = x + 5$

23) $g(x) = \frac{-x+1}{3}$

$g^{-1} = -3x + 1$

24) $g(n) = \sqrt[3]{n+1} + 2$

$g^{-1} = (n-2)^3 - 1$

Solve each equation.

25) $3^{-3x} = 27$ -1

26) $8^{3v-1} = 8^2$ 1

27) $32^{-2x} = 16$ $-\frac{2}{5}$

28) $4^{1-b} = 64$ -2
 $4^{1-b} = 4^3$ $1-b=3$
 $-b=2$
 $b=-2$

Solve each equation. Round your answers to the nearest ten-thousandth.

29) $14^{b+1} - 10 = 3$ -0.0281
 $14^{b+1} = 13$
 $\log_{14}(13) = b+1$

30) $3^{-8k} - 6 = 74$ -0.4986

31) $10^{10k} + 7 = 75$ 0.1833

32) $10 \cdot 14^{a-7} = 45$ 7.5699
 $14^{a-7} = \frac{45}{10}$

$\log_{14}\left(\frac{45}{10}\right) = a-7$

Solve each equation.

33) $\log_{15} 30 = \log_{15} -r$ -30

34) $\log(-m+10) = \log(4m-5)$ 3

35) $\log_{16} 4m = \log_{16} (3m+7)$ 7

36) $\log_3 6 - \log_3 -4x = 1$ $-\frac{1}{2}$

37) $\log_2 x + \log_2 (x+2) = 3$ 2
 $x = -1, 2$

38) $\log_5 (x^2+6) - \log_5 10 = \log_5 79$ ± 28

$\log_5 \left(\frac{x^2+6}{10}\right) = \log_5 79$

Condense each expression to a single logarithm.

39) $\log_8 5 + \frac{\log_8 2}{3} + \frac{\log_8 3}{3}$

$\log_8 5 \cdot \sqrt[3]{2} \cdot \sqrt[3]{3}$

40) $3 \log_4 x - 6 \log_4 y$

$\log_4 \frac{x^3}{y^6}$

$\frac{x^2+6}{10} = 79$

$x^2+6 = 790$

$x^2 = 784$

± 28

Expand each logarithm.

41) $\log_4 (a^6 \cdot b)^5$

$30 \log_4 a + 5 \log_4 b$

42) $\log_6 \left(\frac{x^5}{y}\right)^3$

$15 \log_6 x - 3 \log_6 y$

Identify the domain and range of each. Then sketch the graph.

43) $y = \log_3 (x + 2) + 2$

VA: $x = -2$

Domain $(-2, \infty)$

Range $(-\infty, \infty)$



44) $y = \log_2 (x - 1) - 4$

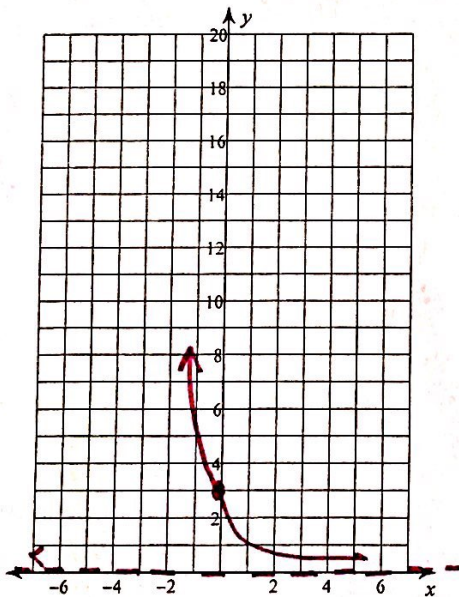
VA: $x = 1$

Domain $(1, \infty)$

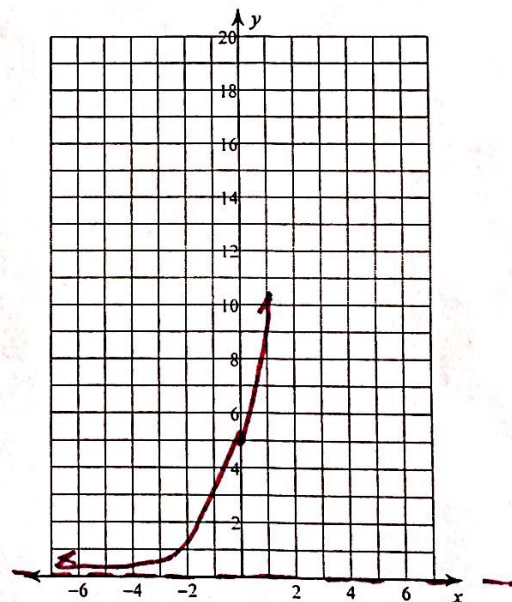


Sketch the graph of each function.

45) $y = 3 \cdot \left(\frac{1}{2}\right)^x$



46) $y = 5 \cdot 2^x$



Find the inverse of each function.

47) $y = 5^x - 3$

$y = \log_5 (x + 3)$

48) $y = \log_3 10^x$ $y = \log_3 3^x$

49) $y = 5^x - 9$

$y = \log_5 (x + 9)$

50) $y = 2^x + 8$

$y = \log_2 (x - 8)$