

Find the inverse of the one-to-one function.

1) $f(x) = \frac{3x - 5}{4}$ 1) _____

- A) $f^{-1}(x) = \frac{4x - 5}{3}$ B) $f^{-1}(x) = \frac{4}{3x - 5}$ C) $f^{-1}(x) = \frac{4x + 5}{3}$ D) $f^{-1}(x) = \frac{4}{3x + 5}$

2) $f(x) = \sqrt[3]{x + 6}$ 2) _____

- A) $f^{-1}(x) = x - 6$ B) $f^{-1}(x) = x^3 - 6$ C) $f^{-1}(x) = \frac{1}{x^3 - 6}$ D) $f^{-1}(x) = x^3 + 36$

Determine whether the functions f and g are inverses of each other.

3) $f(x) = 6x + 2$; $g(x) = \frac{x - 2}{6}$ 3) _____

- A) Yes B) No

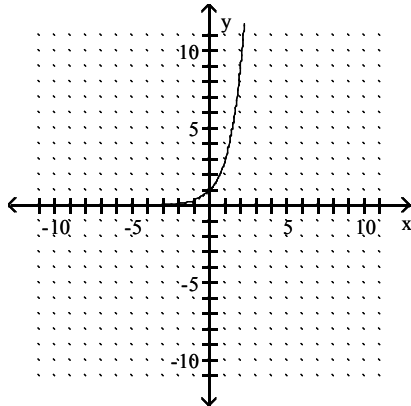
4) $f(x) = 3x + 3$; $g(x) = \frac{x + 3}{3}$ 4) _____

- A) Yes B) No

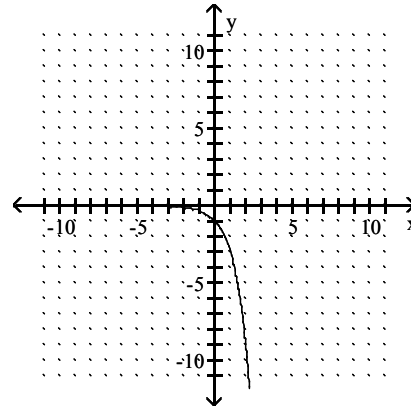
Graph the exponential function.

5) $f(x) = 3^x$ 5) _____

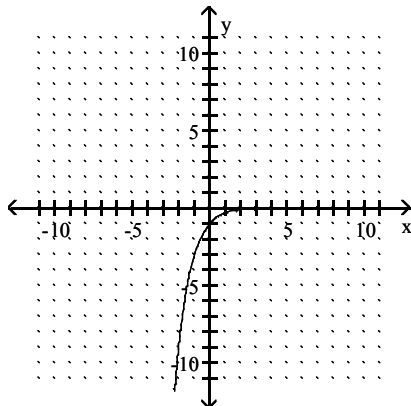
A)



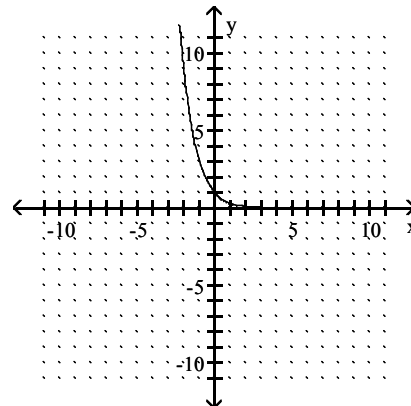
B)



C)



D)



Find the inverse of the one-to-one function.

6) $f(x) = 3x + 5$

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

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

C) $f^{-1}(x) = -\frac{x-5}{3}$

D) $f^{-1}(x) = \frac{x-5}{3}$

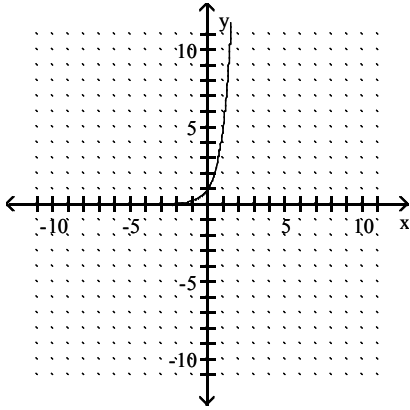
6) _____

Graph the exponential function.

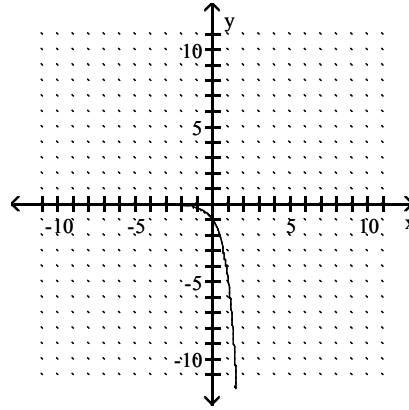
7) $f(x) = \left(\frac{1}{5}\right)^x$

7) _____

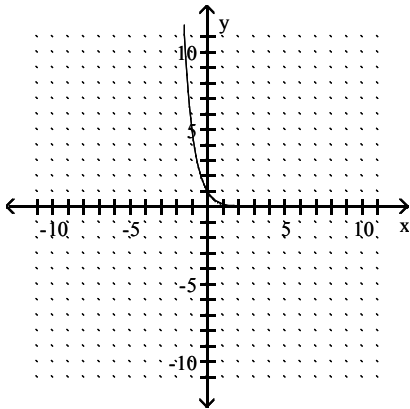
A)



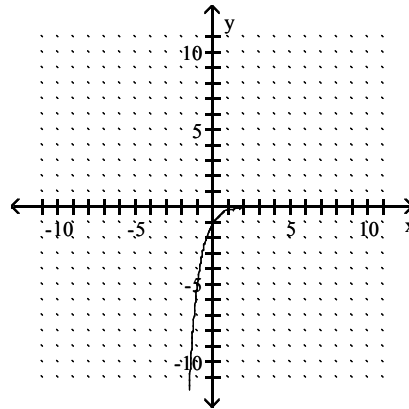
B)



C)



D)



Solve the equation.

8) $5^x = 625$

A) 125

B) 4

C) 3

D) 5

8) _____

9) $2^{-x} = \frac{1}{8}$

A) 3

B) $\frac{1}{3}$

C) $\frac{1}{4}$

D) -3

9) _____

10) $3(3^x - 6) = 27$

A) 9

B) 3

C) -3

D) $\frac{1}{9}$

10) _____

11) $4(9 - 2x) = 4$

A) -4

B) 3

C) 5

D) 4

11) _____

Solve.

- 12) Four bacteria are placed in a petri dish. The population will double every day. The formula for the number of bacteria in the dish on day t is 12) _____

$$N(t) = 4(2)^t$$

where t is the number of days after the four bacteria are placed in the dish. How many bacteria are in the dish eight days after the four bacteria are placed in the dish?

- A) 1024 B) 256 C) 64 D) 14

- 13) The rabbit population in a forest area grows at the rate of 9% monthly. If there are 160 rabbits in September, find how many rabbits (rounded to the nearest whole number) should be expected by next September. Use $y = 160(2.7)^{0.09t}$. 13) _____

- A) 467 B) 455 C) 468 D) 481

Write as an exponential equation.

- 14) $\log_5 25 = 2$ 14) _____

- A) $5^{25} = 2$ B) $25^2 = 5$ C) $2^5 = 25$ D) $5^2 = 25$

- 15) $\log_2 \frac{1}{8} = -3$ 15) _____

- A) $2^{-3} = \frac{1}{8}$ B) $2^8 = 3$ C) $\left(\frac{1}{8}\right)^3 = 2$ D) $3^2 = \frac{1}{8}$

- 16) $\log_{10} 100,000 = 5$ 16) _____

- A) $100,000^{-5} = 10$ B) $5^{10} = 100,000$ C) $10^{-5} = 100,000$ D) $10^5 = 100,000$

- 17) $\log_{10} \sqrt{10} = \frac{1}{2}$ 17) _____

- A) $10\sqrt{10} = \frac{1}{2}$ B) $\left(\frac{1}{2}\right)^{10} = \sqrt{10}$ C) $\sqrt{10}^2 = 10$ D) $10^{\frac{1}{2}} = \sqrt{10}$

Write as a logarithmic equation.

- 18) $5^2 = 25$ 18) _____

- A) $\log_5 2 = 25$ B) $\log_5 25 = 2$ C) $\log_2 25 = 5$ D) $\log_{25} 5 = 2$

- 19) $3^2 = 9$ 19) _____

- A) $\log_3 2 = 9$ B) $\log_2 9 = 3$ C) $\log_9 3 = 2$ D) $\log_3 9 = 2$

- 20) $5^{-2} = \frac{1}{25}$ 20) _____

- A) $\log_{-2} \frac{1}{25} = 5$ B) $\log_5 -2 = \frac{1}{25}$ C) $\log_5 \frac{1}{25} = -2$ D) $\log_{1/25} 5 = -2$

- 21) $7^{1/5} = \sqrt[5]{7}$ 21) _____

- A) $\log_{1/5} \sqrt[5]{7} = 7$ B) $\log_7 \frac{1}{5} = \sqrt[5]{7}$ C) $\log_7 \sqrt[5]{7} = \frac{1}{5}$ D) $\log_{1/5} 7 = \sqrt[5]{7}$

22) $10^4 = 10,000$

A) $\log_4 10 = 10,000$

C) $\log_4 10,000 = 10$

B) $\log_{10} 10,000 = 4$

D) $\log_{10} 4 = 10,000$

22) _____

Find the value of the logarithmic expression.

23) $\log_2 8$

A) 6

B) $\frac{1}{3}$

C) 1

D) 3

23) _____

24) $\log_{10} \frac{1}{1000}$

A) 1000

B) -30

C) -3

D) 3

24) _____

25) $\log_2 \frac{1}{8}$

A) -3

B) $\frac{1}{3}$

C) 3

D) $-\frac{1}{4}$

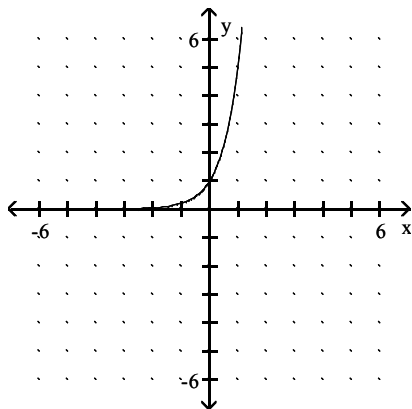
25) _____

Graph the function.

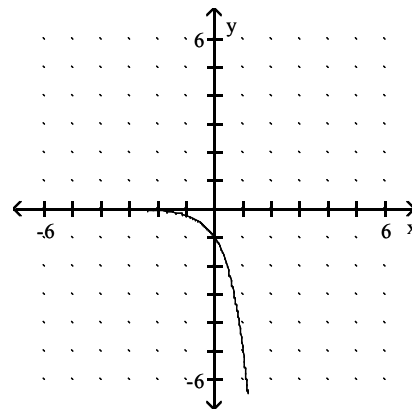
26) $y = \log_5 x$

26) _____

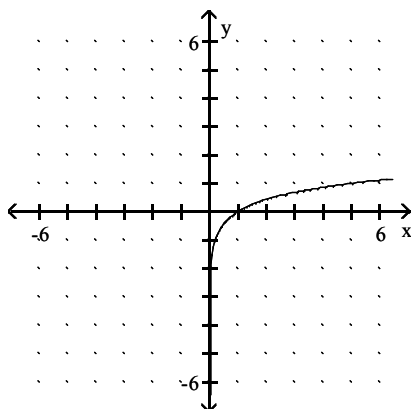
A)



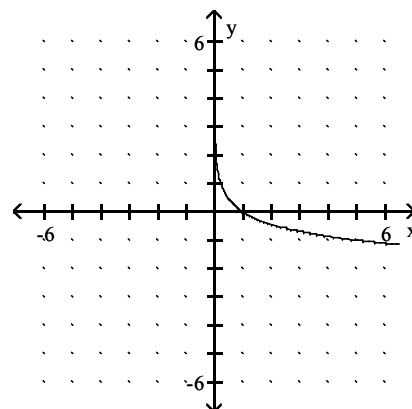
B)



C)



D)

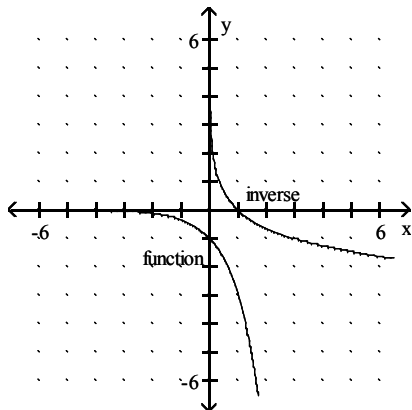


Graph the function and its inverse on the same set of axes.

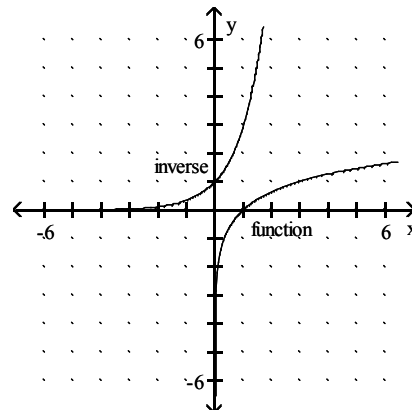
27) $y = \log_3 x$; $y = 3^x$

27) _____

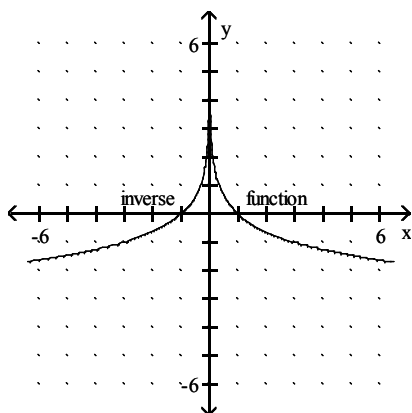
A)



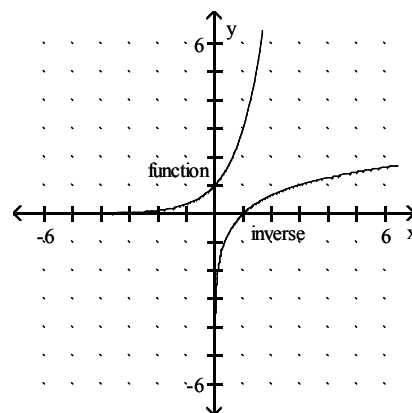
B)



C)



D)



Solve for x.

28) $\log_2 1 = x$

A) 1

B) 0

C) 2

D) 4

28) _____

Simplify.

29) $\log_5 5^{10}$

A) 15

B) 10

C) $\log_5 10$

D) 5

29) _____

30) $5^{\log_5 13}$

A) 5

B) 18

C) 13

D) $\log_5 13$

30) _____

31) $\log_6 6$

A) 1

B) $\frac{1}{6}$

C) 0

D) 6

31) _____

Express as the logarithm of a single expression. Assume that variables represent positive numbers.

32) $\log_7 12 + \log_7 9$

A) $\log_7 21$

B) $\log_{14} 108$

C) $\log_{14} 21$

D) $\log_7 108$

32) _____

33) $\log_5 3 + \log_5 x$ 33) _____
 A) $\log_5 3^x$ B) $\log_5 3x$ C) $\log_5 (x + 3)$ D) $\log_{15} x$

34) $\log_7 3 + \log_7 (x^3 - 4) + \log_7 2$ 34) _____
 A) $\log_7 (x^3 - 24)$ B) $\log_7 (3x^3 - 12)$
 C) $\log_7 (6x^3 - 24)$ D) $\log_7 (x^3 + 1)$

35) $\log_2 7 - \log_2 9$ 35) _____
 A) $\log_2 \frac{9}{7}$ B) $\log_4 \frac{7}{9}$ C) $\log_2 -2$ D) $\log_2 \frac{7}{9}$

36) $\log_7 12 - \log_7 x$ 36) _____
 A) $\log_7 (12 - x)$ B) $\log_{14} \frac{12}{x}$ C) $\log_7 \frac{x}{12}$ D) $\log_7 \frac{12}{x}$

Use the power property to rewrite the expression.

37) $\log_5 x^3$ 37) _____
 A) $3 \log_5 x^3$ B) $5 \log_3 x$ C) $5 \log x$ D) $3 \log_5 x$

38) $\log_5 3^{-2}$ 38) _____
 A) $-10 \log 3$ B) $5 \log_2 3$ C) $3 \log_5 2$ D) $-2 \log_5 3$

39) $\log_8 \sqrt[5]{y}$ 39) _____
 A) $\frac{1}{8} \log_5 y$ B) $\frac{1}{5} \log_8 \sqrt[5]{y}$ C) $5 \log_8 y$ D) $\frac{1}{5} \log_8 y$

Express as the logarithm of a single expression. Assume that variables represent positive numbers.

40) $\log_8 25 + \log_8 2 - \log_8 10$ 40) _____
 A) $\log_8 5$ B) $\log_8 17$ C) $\log_8 \frac{50}{10}$ D) $\log_8 \frac{1}{5}$

Decide whether the statement is true or false.

41) $\log_5 25 + \log_5 125 = 5$ 41) _____
 A) True B) False

Use a calculator to approximate the natural logarithm to four decimal places.

42) $\ln 35$ 42) _____
 A) 3.5553 B) 0.2804 C) 1.5441 D) 12.9151

43) $\ln 0.998$ 43) _____
 A) 0.0020 B) -0.0009 C) -0.0020 D) 0.0009

Approximate the logarithm to four decimal places using the change of base formula.

44) $\log_5 3$

A) -0.2218

B) 0.6826

C) 1.1761

D) 1.4650

44) _____

Solve the equation.

45) $\log_3 x = 5$

A) 243

B) 15

C) 1.46

D) 125

45) _____

46) $\log(2 + x) - \log(x - 4) = \log 3$

A) \emptyset

B) -7

C) $\frac{5}{2}$

D) 7

46) _____

Solve for x.

47) $\log_5 25 = x$

A) 2

B) 5

C) 30

D) 125

47) _____

48) $\log_2 \frac{1}{4} = x$

A) $\frac{1}{8}$

B) $\frac{1}{2}$

C) 2

D) -2

48) _____

49) $\log_3 x = 2$

A) 6

B) 8

C) 5

D) 9

49) _____

50) $\log_4 x = -3$

A) $\frac{1}{81}$

B) 1

C) -12

D) $\frac{1}{64}$

50) _____