

EXPONENTIAL AND LOGARITHMIC FUNCTIONS

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Decide whether the given functions are inverses.

1)

x	f(x)	x	g(x)
2	4	4	2
3	6	6	3
4	8	8	4
5	10	10	5
6	12	12	6

A) No

B) Yes

Decide whether or not the functions are inverses of each other.

2) $f(x) = 8x - 6$, $g(x) = \frac{x + 8}{6}$

A) Yes

B) No

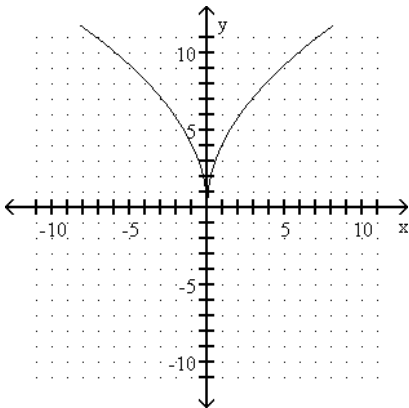
3) $f(x) = \sqrt{x + 3}$, domain $[-3, \infty)$; $g(x) = x^2 + 3$, domain $[-\infty, \infty)$

A) Yes

B) No

Determine whether or not the function is one-to-one.

4)

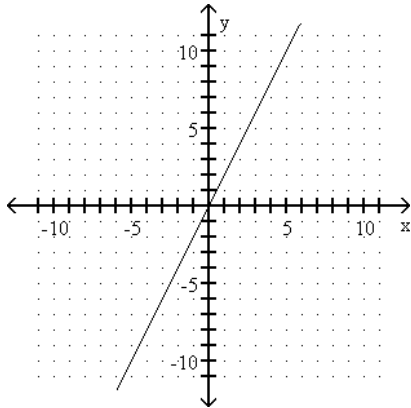


A) Yes

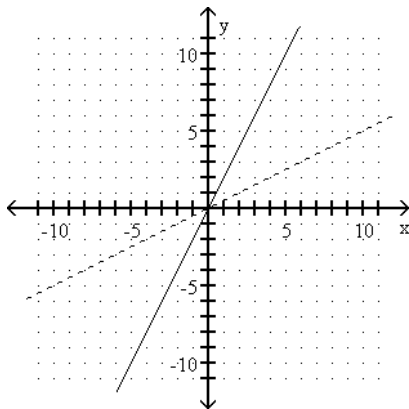
B) No

Graph the inverse of the function plotted, on the same set of axes. Use a dashed curve for the inverse.

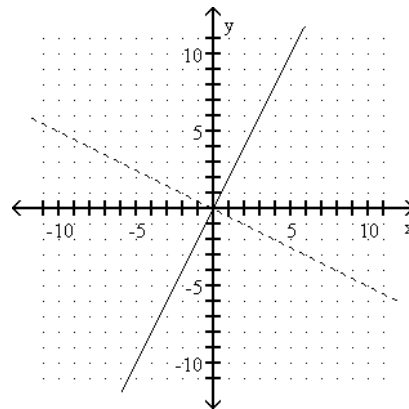
5)



A)

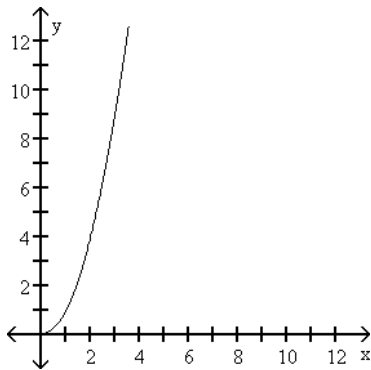


B)



The graph of a function f is given. Use the graph to find the indicated value.

6) $f^{-1}(8)$



A) 64

B) 8

C) 2.8

D) 16

Find the equation of the inverse, if a one-to-one function.

7) $7y = 9x - 6$

A) $f^{-1}(x) = \frac{9x + 7}{9}$

B) Not a one-to-one function

C) $f^{-1}(x) = \frac{7x + 6}{9}$

D) $f^{-1}(x) = \frac{6x + 7}{9}$

8) $y = \sqrt{x+3}$, domain $[-3, \infty)$

A) $f^{-1}(x) = x^2 - 3$

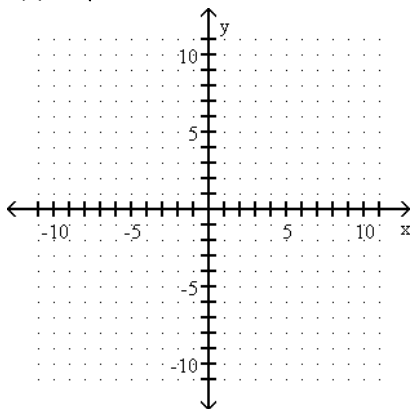
C) Not a one-to-one function

B) $f^{-1}(x) = x^2 - 9$

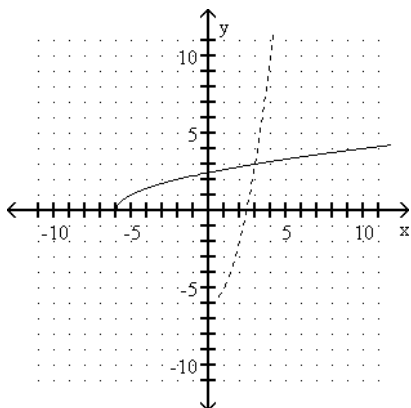
D) $f^{-1}(x) = -x^2 + 3$

Graph the function as a solid curve and its inverse as a dashed curve on the same axes.

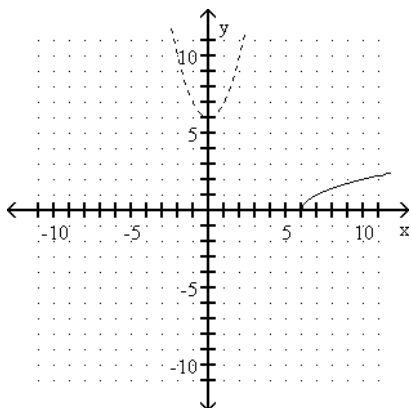
9) $f(x) = \sqrt{x+6}$



A)



B)



If $f(x) = 2^x$ and $g(x) = \frac{1}{3}^x$, find the indicated function value. If the result is irrational, give the answer to 3 decimal places.

10) $f(-4)$

A) 16

B) -8

C) $\frac{1}{16}$

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

11) $g(4)$

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

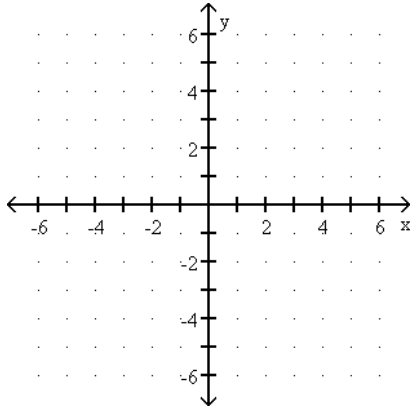
B) -12

C) $\frac{1}{12}$

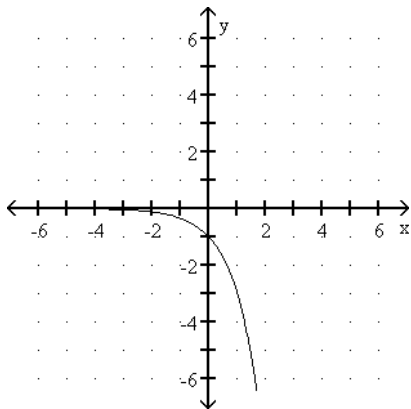
D) 81

Graph the function.

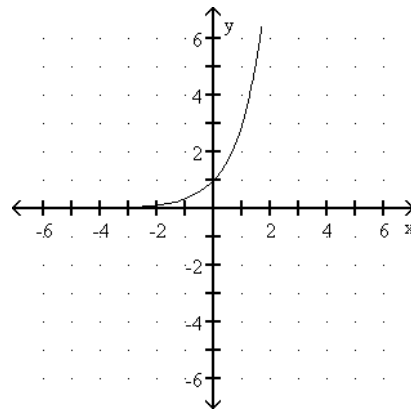
12) $f(x) = 3^x$



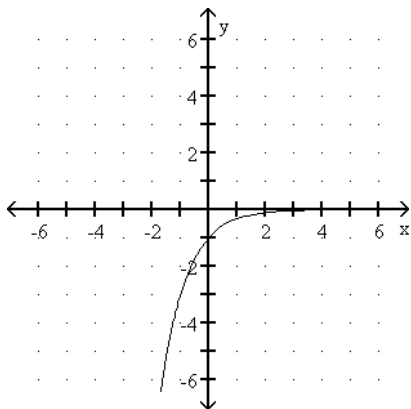
A)



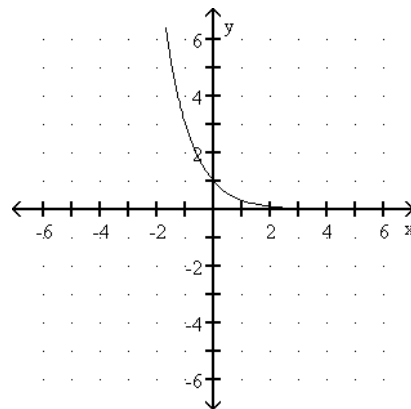
B)



C)



D)



Solve the equation.

13) $\left(\frac{1}{3}\right)^x = 27$

A) $\left\{\frac{1}{3}\right\}$

B) $\{-3\}$

C) $\{3\}$

D) $\left\{-\frac{1}{3}\right\}$

14) $4(8 - 2x) = 256$

A) $\{2\}$

B) $\{4\}$

C) $\{64\}$

D) $\{-2\}$

Find the value of the expression.

15) $\log_3 243$

A) 3

B) 5

C) 243

D) 15

16) $\log_{22} 22$

A) 22

B) 0

C) 10

D) 1

17) $\log_{18} 1$

A) 0

B) 10

C) 18

D) 1

18) $\log_{10} 0.1$

A) -1

B) -0.1

C) 1

D) 0.1

Convert to logarithmic form.

19) $7^{-3} = \frac{1}{343}$

A) $\log_7 \frac{1}{343} = -3$

B) $\log_{1/343} 7 = -3$

C) $\log_7 -3 = \frac{1}{343}$

D) $\log_{-3} \frac{1}{343} = 7$

Convert to exponential form.

20) $\log_9 \frac{1}{81} = -2$

A) $9^{81} = 2$

B) $(\frac{1}{81})^2 = 9$

C) $9^{-2} = \frac{1}{81}$

D) $2^9 = \frac{1}{81}$

Solve the equation.

21) $\log_3 \frac{1}{81} = x$

A) $\left\{ \frac{1}{27} \right\}$

B) $\{-4\}$

C) $\{4\}$

D) $\left\{ \frac{1}{243} \right\}$

22) $\log_x 81 = -2$

A) $\left\{ -\frac{1}{9} \right\}$

B) $\{9\}$

C) $\left\{ \frac{1}{9} \right\}$

D) $\{-9\}$

Evaluate the logarithm to four decimal places.

23) $\log 174$

A) 2.2430

B) 5.1591

C) 2.2405

D) 2.2380

24) $\ln 0.983$

A) 0.0074

B) 0.0171

C) -0.0074

D) -0.0171

Use the change of base rule to find the logarithm to four decimal places.

25) $\log_8 34.39$

A) 0.5878

B) 1.7013

C) 1.5364

D) 4.2988

Solve the equation. If necessary, round to thousandths.

26) $5^{(3x - 1)} = 15$

A) {0.228}

B) {0.700}

C) {0.894}

D) {1.333}

27) $2^x = 18$

A) {2.197}

B) {0.240}

C) {9.000}

D) {4.170}

28) $\ln(y - 6) = \ln(y + 6) + \ln 4$

A) {8.000}

B) {6.000}

C) {-10.000}

D) \emptyset

29) $\ln e^x - \ln e^3 = \ln e^9$

A) {27}

B) {12}

C) {6}

D) {-6}

30) $\log(x + 2) = \log(5x + 1)$

A) {0.333}

B) {0.750}

C) {-0.250}

D) {0.250}