

Logarithmic Functions

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

Write the equation in its equivalent exponential form.

- 1) $\log_4 64 = 3$ 1) _____
A) $4^{64} = 3$ B) $3^4 = 64$ C) $4^3 = 64$ D) $64^3 = 4$

Convert to an exponential equation.

- 2) $\log_7 343 = 3$ 2) _____
A) $7^{343} = 3$ B) $7^3 = 343$ C) $343^3 = 7$ D) $3^7 = 343$

Write the equation in its equivalent exponential form.

- 3) $\log_3 9 = 2$ 3) _____
A) $3^2 = 9$ B) $3^9 = 2$ C) $2^3 = 9$ D) $9^2 = 3$

Find the following using a calculator. Round to four decimal places.

- 4) $\log 14$ 4) _____
A) 1.1461 B) 3.1391 C) 2.6391 D) 0.6461

- 5) $\log 0.68$ 5) _____
A) -0.6675 B) -0.3857 C) 0.1143 D) -0.1675

- 6) $\log 1.892$ 6) _____
A) 0.2769 B) -0.2231 C) 1.1376 D) 0.6376

- 7) $\log (-5)$ 7) _____
A) 1.6094 B) 4 C) Does not exist D) 1.7918

Evaluate the expression without using a calculator.

- 8) $\log_{11} 1$ 8) _____
A) $\frac{1}{11}$ B) 1 C) 11 D) 0

- 9) $\log_8 8$ 9) _____
A) 8 B) $\frac{1}{8}$ C) 1 D) 0

Find the value of the expression.

- 10) $\log_{16} 1$ 10) _____
A) 1 B) 0 C) 10 D) 16

Solve the logarithmic equation. Be sure to reject any value that is not in the domain of the original logarithmic expressions. Give the exact answer.

11) $\log(x+4) = \log(4x-5)$ 11) _____

- A) $\left\{\frac{9}{5}\right\}$ B) $\left\{\frac{1}{3}\right\}$ C) $\{-3\}$ D) $\{3\}$

12) $\log(x+5) = \log(4x+2)$ 12) _____

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

13) $\log_5(5x-7) = \log_5(2x+5)$ 13) _____

- A) $\left\{-\frac{2}{3}\right\}$ B) \emptyset C) $\{4\}$ D) $\{-2\}$

14) $\log_6 x^2 = \log_6(3x+28)$ 14) _____

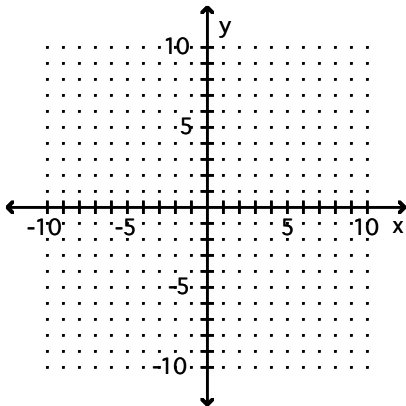
- A) \emptyset B) $\left\{\frac{7}{6}\right\}$ C) $\{7\}$ D) $\{7, -4\}$

15) $\log_9 x^2 = \log_9(6x+7)$ 15) _____

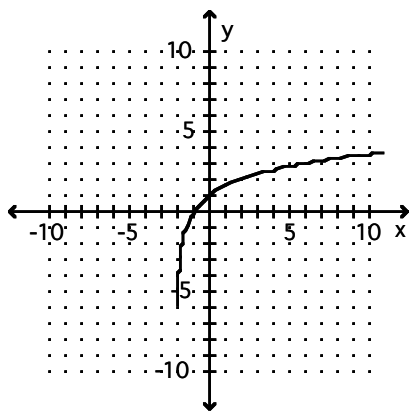
- A) $\left\{\frac{7}{9}\right\}$ B) $\{7, -1\}$ C) $\{7\}$ D) \emptyset

Graph the function.

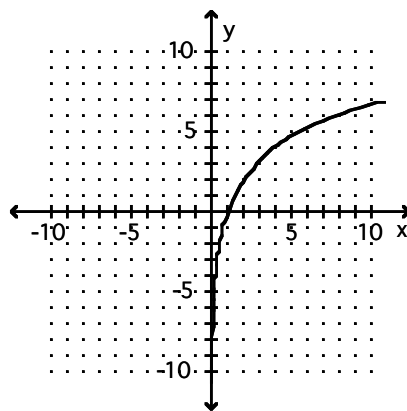
16) Use the graph of $\log_2 x$ to obtain the graph of $f(x) = \log_2(x+2)$. 16) _____



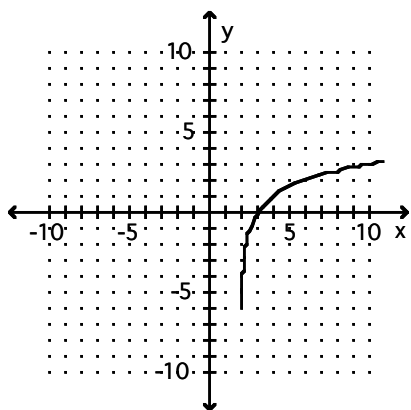
A)



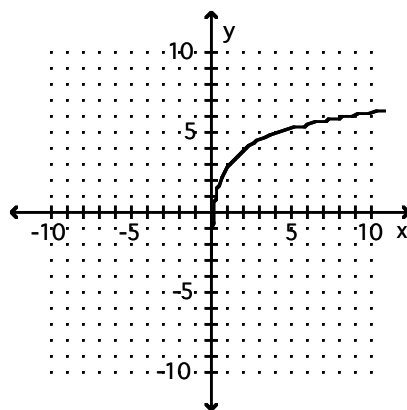
B)



C)

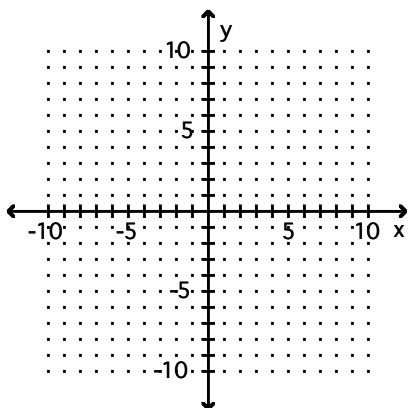


D)

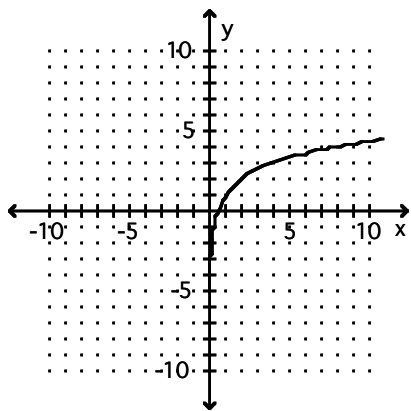


17) Use the graph of $\log_2 x$ to obtain the graph of $f(x) = 1 + \log_2 x$.

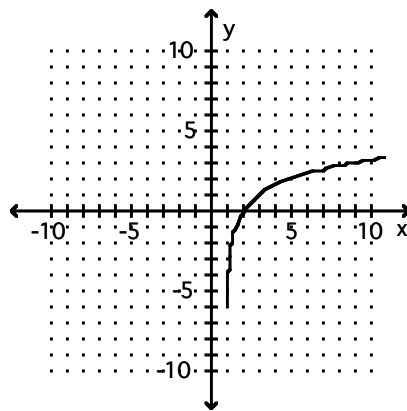
17) _____



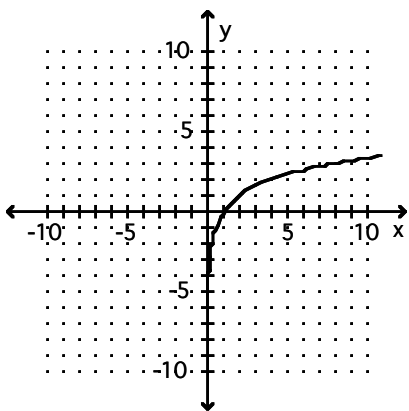
A)



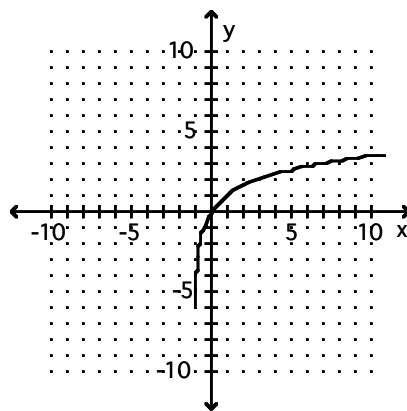
B)



C)



D)



Find the following using a calculator. Round to four decimal places.

18) $\ln 275$ A) 5.6168 B) 0.1775 C) 101.4760 D) 2.4393 18) _____

19) $\ln 0.995$ A) -0.0050 B) 0.0050 C) -0.0022 D) 0.0022 19) _____

20) $\ln 0$ A) -0.6808 B) -0.6697 C) Does not exist D) -0.7054 20) _____

21) $\ln 4,300,000$ A) 6.6335 B) 0.0653 C) 3.7612 D) 15.2741 21) _____

Solve the logarithmic equation.

22) $\ln x = 4$ A) e^4 B) $4e$ C) $\ln 4$ D) 10,000 22) _____

23) $\log_2 x = 5$ A) 10 B) 32 C) 100 D) 25 23) _____

24) $\log_{16} x = \frac{1}{2}$ A) 0.00001526 B) 65,536 C) 4 D) 256 24) _____

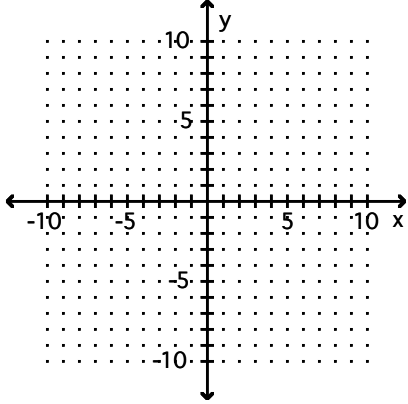
25) $\log_7 x = -3$ A) 2187 B) $\frac{1}{343}$ C) 343 D) $\frac{1}{2187}$ 25) _____

26) $\ln x = 2$ A) e^2 B) 100 C) $2e$ D) $\ln 2$ 26) _____

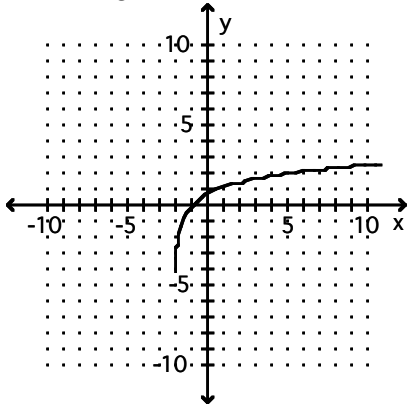
Graph the function. Describe its position relative to the graph of the indicated basic function.

27) $f(x) = \ln(x - 2)$; relative to $f(x) = \ln x$

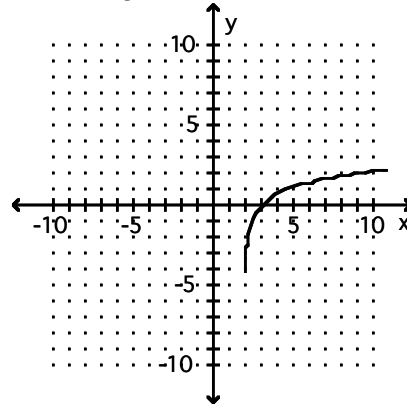
27) _____



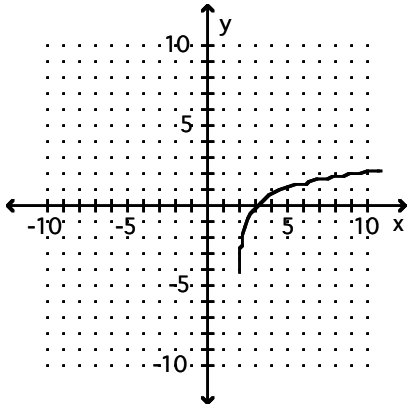
A) Moved right 2 units



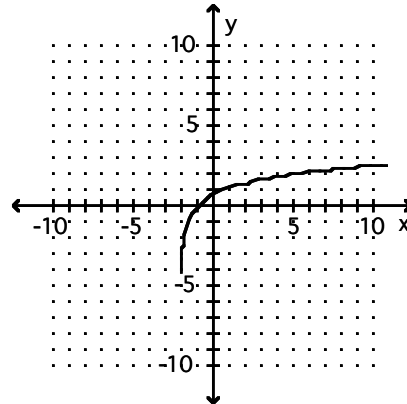
B) Moved right 2 units



C) Moved left 2 units



D) Moved left 2 units



Answer Key

Testname: LOGARITHMIC FUNCTIONS

- 1) C
- 2) B
- 3) A
- 4) A
- 5) D
- 6) A
- 7) C
- 8) D
- 9) C
- 10) B
- 11) D
- 12) C
- 13) C
- 14) D
- 15) B
- 16) A
- 17) A
- 18) A
- 19) A
- 20) C
- 21) D
- 22) A
- 23) B
- 24) C
- 25) B
- 26) A
- 27) B