

1. Determine the exponential form of $a = \log_b c$.

- A. $a = b^c$
- B. $b = a^c$
- C. $c = a^b$
- D. $c = b^a$

2. Evaluate: $\log_2 \sqrt{8}$

- A. $\sqrt{2}$
- B. $\frac{3}{2}$
- C. 3
- D. 8

3. The inverse relation of $y = \log 2x$ is given by which one of the following?

- A. $y = \frac{10^x}{2}$
- B. $y = 5^x$
- C. $y = 10^{2x}$
- D. $y = \frac{1}{\log 2x}$

4. Solve for x : $\log_2 [\log_x (\log_x 9)] = -1$

- A. 2
- B. 3
- C. 4
- D. 5

5. Determine the logarithmic form of $4^x = 3$.

- A. $\log_3 x = 4$
- B. $\log_3 4 = x$
- C. $\log_x 4 = 3$
- D. $\log_4 3 = x$

6. What is the value of x if $\log_5 x = 4$?

- A. $\sqrt[5]{4}$
- B. $\sqrt[4]{5}$
- C. 5^4
- D. 4^5

7. Evaluate: $-16 \log_2 \left(\frac{1}{8} \right)$

A. -4

B. $-\frac{1}{4}$

C. 0

D. 48

8. If $8^{14} = x$, then

A. $\log_x 8 = 14$

B. $\log_x 14 = 8$

C. $\log_{14} 8 = x$

D. $\log_8 x = 14$

9. Evaluate: $\log_{\sqrt{3}} 125$

A. $\frac{3}{2}$

B. 3

C. 5

D. 6

10. The graph of the exponential function $y = b^x$ contains the point $(-2, 9)$. Determine the value of b .

A. $-\frac{9}{2}$

B. -3

C. $\frac{1}{3}$

D. 3

11. Write $a^b = c$ in logarithmic form.

A. $\log_a c = b$

B. $\log_a b = c$

C. $\log_c a = b$

D. $\log_b a = c$

12. Determine all values of x such that the expression $\frac{1}{\log(2x-5)}$ is defined.

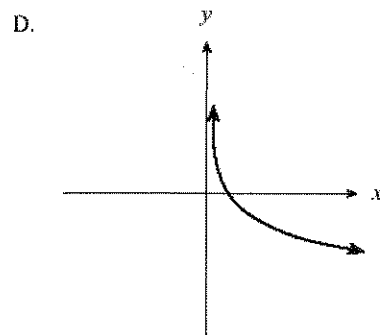
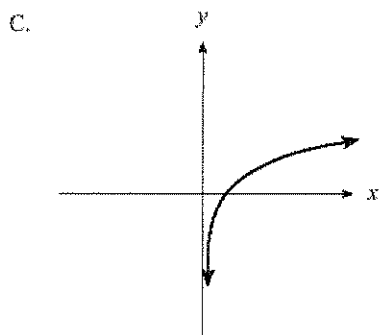
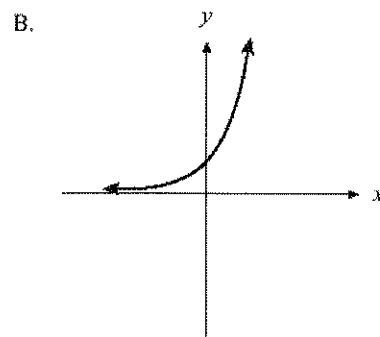
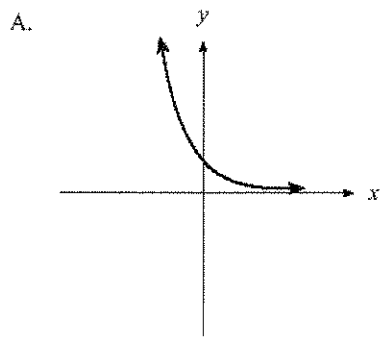
A. $x \neq 3$

B. $x > \frac{5}{2}$

C. $0 < x < \frac{5}{2}$

D. $x > \frac{5}{2}, x \neq 3$

13. Determine which graph **best** represents $y = \left(\frac{1}{2}\right)^x$.



14. Evaluate: $\log_2 16$

- A. $\frac{1}{4}$
- B. 4
- C. 8
- D. 256

15. Give the equation of the inverse function of $y = 4^x$.

- A. $x = \log_4 y$
- B. $x = \log_y 4$
- C. $y = \log_x 4$
- D. $y = \log_4 x$

16. Solve for x : $\log_2(\log_{16} x) = -1$

- A. 2
- B. 4
- C. 8
- D. 16

17. Solve: $\log_2 x = 1$

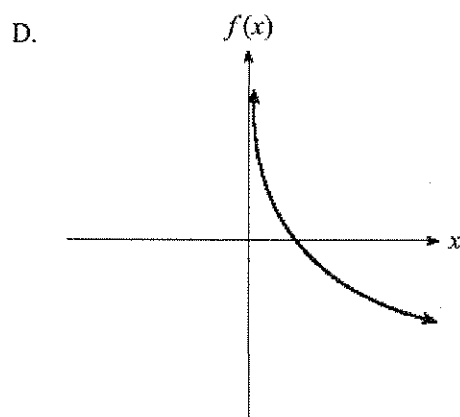
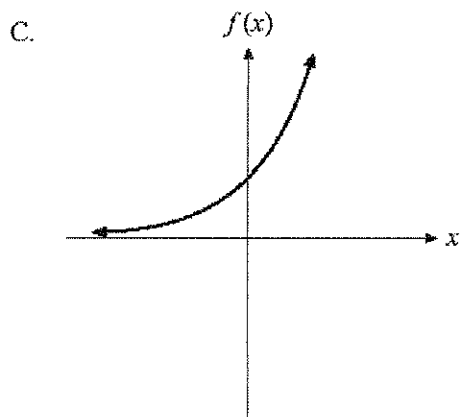
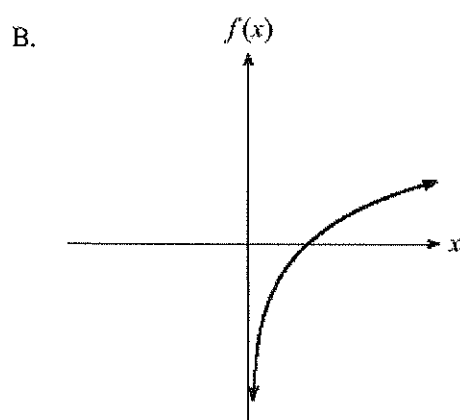
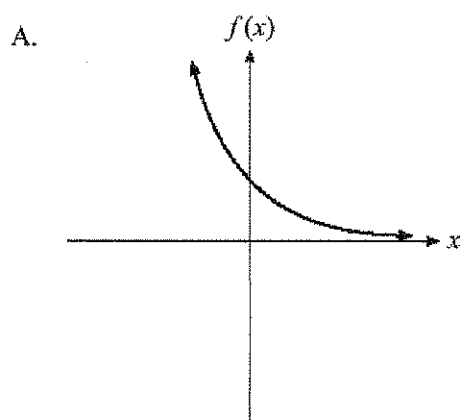
- A. 0
- B. $\frac{1}{2}$
- C. 1
- D. 2

18. Solve: $2^{\log x} = \frac{1}{4}$
- A. -2
 - B. $\frac{1}{100}$
 - C. 2
 - D. 100
19. A light filter reduces the intensity of light going through it by 10%. What percent of light passes through 8 such filters? (Accurate to the nearest percent.)
- A. 20%
 - B. 30%
 - C. 43%
 - D. 48%
20. Given $f(x) = \log_3 x$, determine its inverse, $f^{-1}(x)$.
- A. $f^{-1}(x) = x^3$
 - B. $f^{-1}(x) = 3^x$
 - C. $f^{-1}(x) = \log_x 3$
 - D. $f^{-1}(x) = \log_3 \frac{1}{x}$
21. Give the domain of the function $y = \log_2(x - 4)$.
- A. $x > -4$
 - B. $x > 0$
 - C. $x > 2$
 - D. $x > 4$
22. Evaluate: $\log_3 3^{-15}$
- A. -15
 - B. -5
 - C. $\frac{1}{15}$
 - D. $\frac{1}{5}$
23. Which of the following equations can be used to determine the number of years, t , that are needed for a \$300 deposit to increase to \$1 500 if it is invested at 9% compounded annually?
- A. $1\,500 = 300(1.09)^t$
 - B. $300 = 1\,500(1.09)^t$
 - C. $1\,500 = 300(1.9)^t$
 - D. $300 = 1\,500(1.9)^t$

24. A bacteria population halves in size every 5 days. Determine an expression for the number of bacteria remaining after t days, if the beginning population is k .

- A. $k(5)^{\frac{t}{5}}$
- B. $k(5)^{-2t}$
- C. $k\left(\frac{1}{2}\right)^{5t}$
- D. $k\left(\frac{1}{2}\right)^{\frac{t}{5}}$

25. Which graph **best** represents the function $f(x) = 3^{-x}$?



Key

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

