

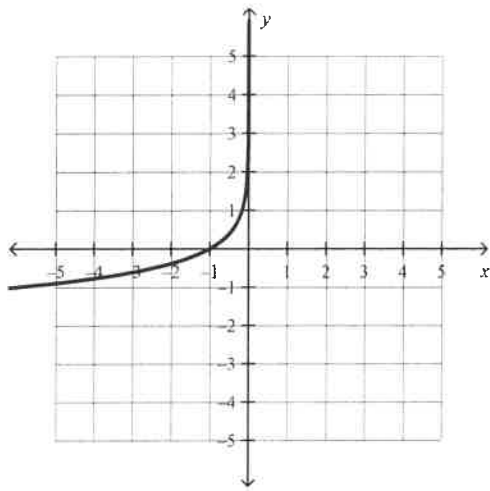
Pre-Calculus 12 Chapter 8 Review

Multiple Choice

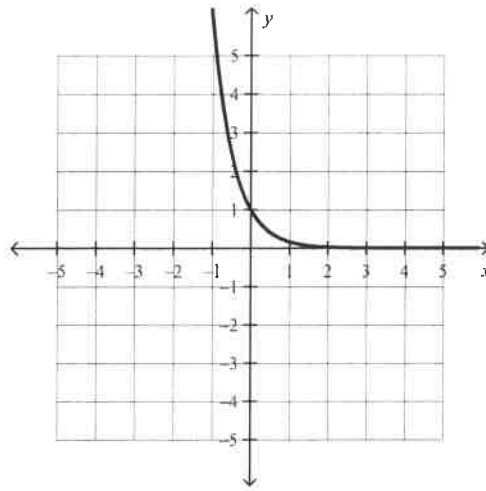
Identify the choice that best completes the statement or answers the question.

____ 1. Which graph represents the inverse of $y = \left(\frac{1}{6}\right)^x$?

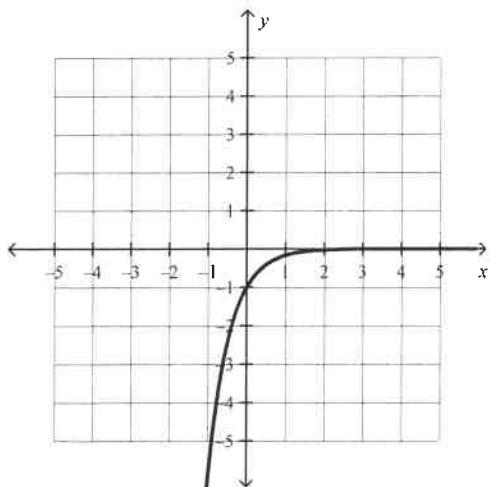
A.



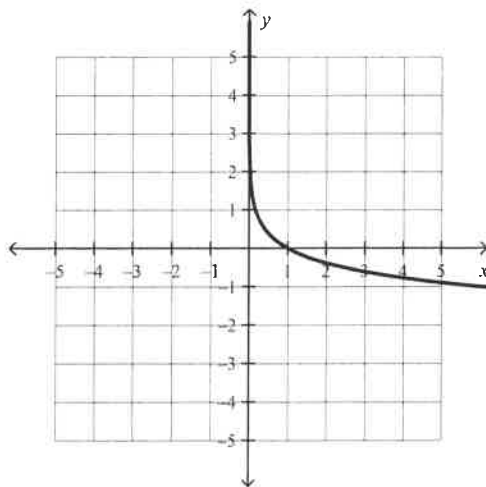
C.



B.



D.

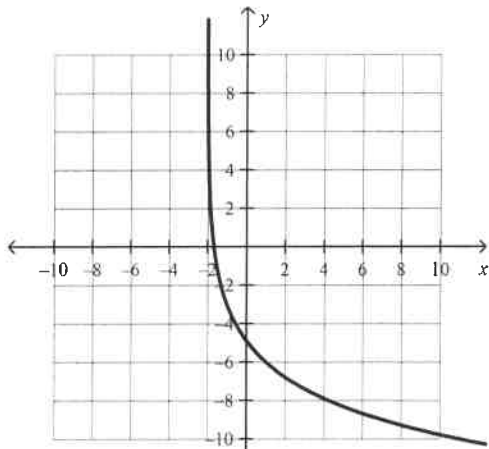


Name: _____

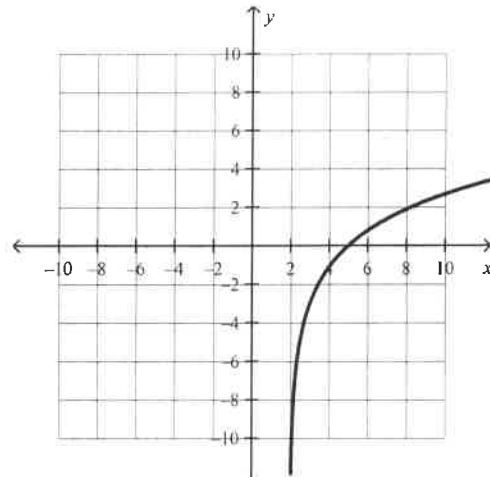
ID: A

2. Which graph represents the function $y = -3 \log_3[(x-2)] - 3$?

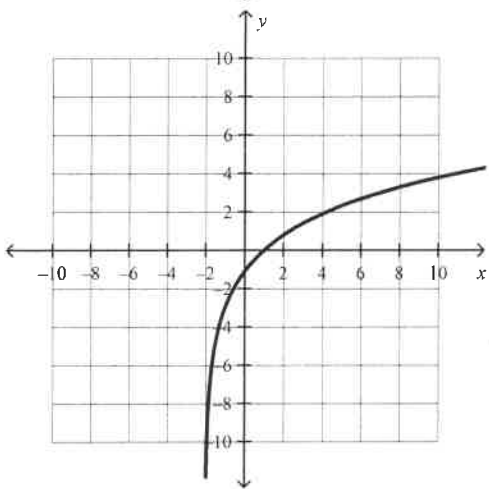
A.



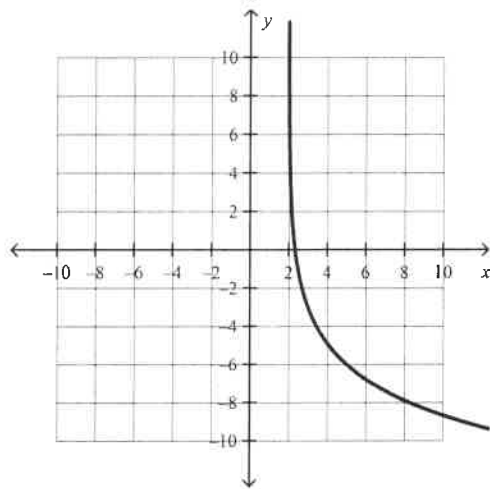
C.



B.

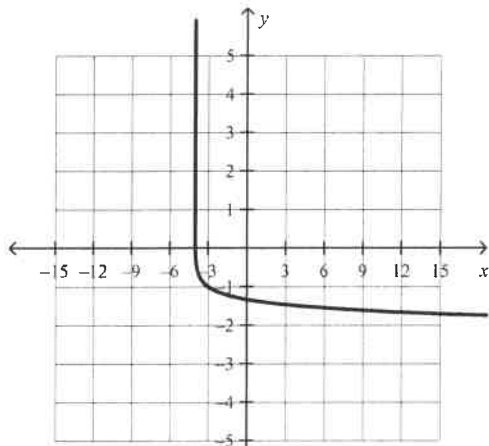


D.

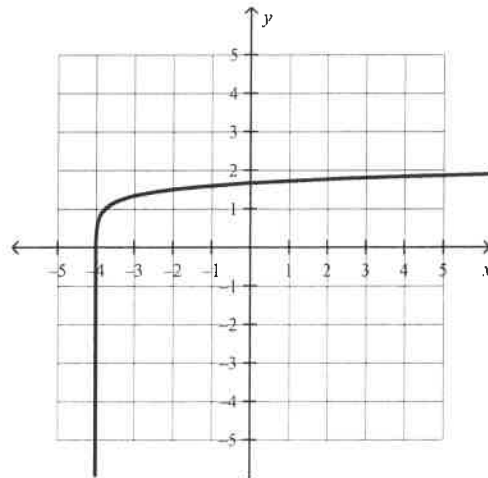


_____ 3. Which graph represents the function $y = \frac{1}{3} \log_4(x - 3) + 4$?

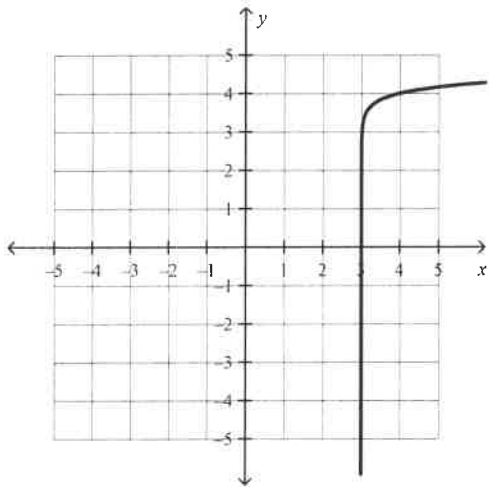
A.



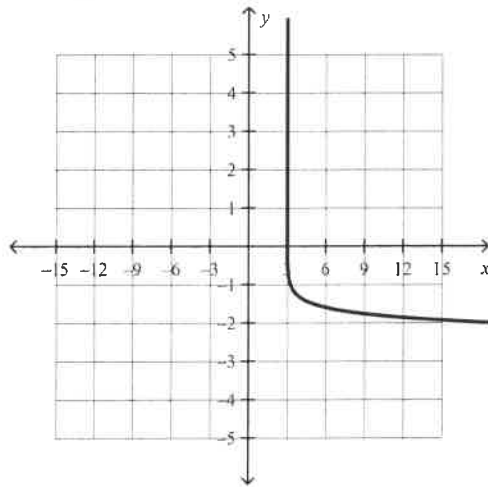
C.



B.



D.



Name: _____

ID: A

- _____ 4. The domain of the function $f(x) = 8 \log_6[8(x+8)] + 7$ is
- A. $\{x|x < 7, x \in \mathbb{R}\}$ C. $\{x|x > 7, x \in \mathbb{R}\}$
B. $\{x|x < -8, x \in \mathbb{R}\}$ D. $\{x|x > -8, x \in \mathbb{R}\}$
- _____ 5. What is the equation for the asymptote of the function $f(x) = -\log_7[-5(x+2)] - 3$?
- A. $x = 2$ C. $x = -5$
B. $x = -3$ D. $x = -2$

Short Answer

1. Evaluate $\log_2 \sqrt[4]{32}$ **without a calculator.**

Name: _____

ID: A

2. Expand the expression $\log_6 rw^2x$ in terms of individual logarithms of the variables.

3. Simplify the expression $2 \log_2 12 - (\log_2 6 + \frac{1}{3} \log_2 27)$ **without a calculator.**

4. Write the expression $\log_3 r + 6 \log_3 v - \log_3 x$ as a single logarithm in simplest form.

5. Simplify $3 \log \sqrt{x} + 2 \log x - \frac{1}{2} \log x$

Name: _____

ID: A

6. If $\log 3 = s$, $\log 5 = v$, and $\log 7 = z$, an algebraic expression in terms of s , v , and z for $\log \frac{5}{441}$ is

7. Given $\log_2 7 = k$ write an algebraic expression, in terms of k , for the value of $\log_2 392$.

8. Solve $\log_3 x = \log_3 2 + \log_3 3$.

9. Solve the equation $\log_2 \sqrt{x^2 - 8x} = \log_2 3$.

Name: _____

ID: A

10. Solve the equation $\log \sqrt[3]{x^2 + 48x} = \frac{2}{3}$.

11. Solve $\log(3x + 15) = 1 + \log(x + 3)$.

12. Solve $2 \log_4(x + 4) - \log_4(x + 12) = 1$

13. Solve $1500 = 5e^{0.045x}$ to the nearest thousandth.

Name: _____

ID: A

14. Solve $9^{3x-10} = 8^{x+6}$. Round your answer to two decimal places.

15. Solve $13(5)^{4x-3} = 8^{2x+5}$. Round your answer to 2 decimal places.

16. Suppose that the population of a small town doubles every 25 years. How long does it take to triple, to the nearest tenth of a year?

17. The eye size of many vertebrates is related to body mass by the logarithmic equation $\log E = \log 10.61 + 0.1964 \log m$, where E is the eye axial length, in millimetres, and m is the body mass, in kilograms. Predict the mass of a vertebrate with an eye axial length of 43 mm. Round your answer to the nearest hundredth of a kilogram.
18. A 200-g sample of a radioactive substance is placed in a chamber to be tested. After 3 h, 140 g of the sample remains. Determine the half-life of this substance, to the nearest hundredth of an hour.
19. For his dream car, Bruce invested \$18 000 at 7.8% interest per annum, compounded semi-annually. How long will he have to invest in order to have a total of \$35 000? Round to the nearest tenth of a year.
20. In 1997, the population of a city was 795 000. This was an increase of 3.06% from the previous year. Assuming that the population is growing continuously, to the nearest tenth of a year, how long it take for the population to exceed 1 million?

Pre-Calculus 12 Chapter 8 Review

Answer Section

MULTIPLE CHOICE

1. ANS: D PTS: 1 DIF: Easy OBJ: Section 8.1
NAT: RF7 TOP: Understanding Logarithms KEY: graph | inverse
2. ANS: D PTS: 1 DIF: Average OBJ: Section 8.2
NAT: RF8 TOP: Transformations of Logarithmic Functions
KEY: horizontal translation | vertical translation | vertical stretch | horizontal stretch
3. ANS: B PTS: 1 DIF: Average OBJ: Section 8.2
NAT: RF8 TOP: Transformations of Logarithmic Functions
KEY: horizontal translation | vertical translation | vertical stretch
4. ANS: D PTS: 1 DIF: Average OBJ: Section 8.2
NAT: RF8 TOP: Transformations of Logarithmic Functions
KEY: domain | logarithmic functions
5. ANS: D PTS: 1 DIF: Average OBJ: Section 8.2
NAT: RF8 TOP: Transformations of Logarithmic Functions
KEY: horizontal translation | asymptote

SHORT ANSWER

1. ANS:
 $\frac{5}{4}$

PTS: 1 DIF: Average OBJ: Section 8.1 NAT: RF7
TOP: Understanding Logarithms KEY: logarithm NOT: Draft
2. ANS:
 $\log_6 r + 2 \log_6 w + \log_6 x$

PTS: 1 DIF: Easy OBJ: Section 8.3 NAT: RF9
TOP: Laws of Logarithms KEY: product law | laws of logarithms
3. ANS:
3

PTS: 1 DIF: Easy OBJ: Section 8.3 NAT: RF9
TOP: Laws of Logarithms KEY: product law | laws of logarithms | quotient law
4. ANS:
 $\log_3 \frac{rv^6}{x}$

PTS: 1 DIF: Easy OBJ: Section 8.3 NAT: RF9
TOP: Laws of Logarithms KEY: product law | laws of logarithms

5. ANS:
 $3 \log x$

PTS: 1 DIF: Average OBJ: Section 8.3 NAT: RF9
 TOP: Laws of Logarithms
 KEY: laws of logarithms | power law | quotient law | product law

6. ANS:
 $v - 2s - 2z$ or $v - (2s + 2z)$ or $v - 2(s + z)$

PTS: 1 DIF: Average OBJ: Section 8.3 NAT: RF9
 TOP: Laws of Logarithms KEY: product law | laws of logarithms | quotient law

7. ANS:
 $2k + 3$

PTS: 1 DIF: Difficult OBJ: Section 8.3 NAT: RF9
 TOP: Laws of Logarithms KEY: power law of logarithms

8. ANS:
 $x = 6$

PTS: 1 DIF: Average OBJ: Section 8.4 NAT: RF10
 TOP: Logarithmic and Exponential Equations KEY: logarithmic equation

9. ANS:
 $x = 9$ or $x = -1$

Check the values for extraneous roots.
 In this case, both values are possible.

PTS: 1 DIF: Difficult OBJ: Section 8.4 NAT: RF10
 TOP: Logarithmic and Exponential Equations
 KEY: logarithmic equation | extraneous roots

10. ANS:
 $x = -50$ or $x = 2$

Check the values for extraneous roots.
 In this case, both solutions are possible.

PTS: 1 DIF: Difficult OBJ: Section 8.4 NAT: RF10
 TOP: Logarithmic and Exponential Equations
 KEY: logarithmic equation | extraneous roots

11. ANS:
 $\frac{15}{7}$

PTS: 1 DIF: Average OBJ: Section 8.4 NAT: RF10
 TOP: Logarithmic and Exponential Equations KEY: logarithmic equation

12. ANS:

$$x = -8, x = 4$$

Since $x = -8$ is an extraneous root, the solution is $x = 4$.

PTS: 1 DIF: Average OBJ: Section 8.4 NAT: RF10

TOP: Logarithmic and Exponential Equations

KEY: logarithmic equation | laws of logarithms NOT: Draft

13. ANS:

126.751

PTS: 1 DIF: Easy OBJ: Section 8.4 NAT: RF10

TOP: Logarithmic and Exponential Equations

KEY: exponential equation

14. ANS:

7.63

PTS: 1 DIF: Average OBJ: Section 8.4 NAT: RF10

TOP: Logarithmic and Exponential Equations

KEY: logarithmic equation | exponential equation

15. ANS:

5.56

PTS: 1

16. ANS:

It will take 39.6 years for the population to triple.

PTS: 1 DIF: Difficult + OBJ: Section 8.3 | Section 8.4

NAT: RF9 TOP: Laws of Logarithms | Logarithmic and Exponential Equations

KEY: power law | law of logarithms | logarithmic equation | exponential equation

17. ANS:

1242.98

PTS: 1 DIF: Difficult OBJ: Section 8.1 | Section 8.4

NAT: RF10 | RF7 TOP: Understanding Logarithms | Logarithmic and Exponential Equations

KEY: exponential equation | logarithmic equation

18. ANS:

The half-life is 5.83 h.

PTS: 1 DIF: Difficult OBJ: Section 8.4 NAT: RF10

TOP: Logarithmic and Exponential Equations

KEY: exponential equation | logarithmic equation

19. ANS:

Bruce will need invest for approximately 8.7 years.

PTS: 1 DIF: Difficult OBJ: Section 8.4 NAT: RF10

TOP: Exponential and Logarithmic Equations

KEY: exponential function | logarithmic equation

20. 7.5 years