Math 12 Principles
Chapter 2 Review
Exponential Functions

Determine an equation for the asymptote of the graph of $y = 2^{x+3} + 4$.

A. $y = 4$
B. $x = 3$
C. $x = -3$
D. $y = -4$

Solve: $9^x = 27^{x-3}$

A. $-9$
B. $3$
C. $\frac{9}{2}$
D. $9$

Solve: $\log_5(3x) - \log_5(x-3) = 2$

A. $-6$
B. $-\frac{1}{2}$
C. $\frac{75}{22}$
D. $11$

Change $\log_2(3x) = 5$ to exponential form.

A. $3x = 2^5$
B. $3x = 5^2$
C. $2 = (3x)^5$
D. $2 = 3x^5$

Evaluate: $\log_5 \sqrt{5^3}$

A. $\frac{1}{6}$
B. $\frac{2}{3}$
C. $\frac{3}{2}$
D. $6$

If $\log_2 5 = x$ and $\log_2 3 = y$, determine an expression for $\log_2\left(\frac{15}{2}\right)$, in terms of $x$ and $y$.

A. $xy$
B. $x+y$
C. $xy-1$
D. $x+y-1$

Determine the number of terms in the geometric sequence $3, 6, 12, \ldots, 49\,152$.

A. 13
B. 14
C. 15
D. 16

Solve: $\log_2\left(\log_x\left(x+6\right)\right)=1$

A. 2
B. 3
C. 2, 3
D. −2, 3

Determine the sum of the infinite geometric series $16-12+9-\ldots$

A. $\frac{48}{7}$
B. $\frac{64}{7}$
C. 64
D. no finite sum

Which of the following is a geometric sequence?

A. 1, 4, 9, ...
B. 2, 4, 10, ...
C. 12, 7, 2, ...
D. 18, 12, 8, ...

Evaluate: $\sum_{k=3}^{12} 32\left(-\frac{1}{2}\right)^k$

A. −21.35
B. −21.31
C. −2.67
D. −2.66

The 4th term of a geometric sequence is 250 and the 7th term is $-16$. Determine the 10th term

A. $-\frac{2}{5}$

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

C. $-\frac{128}{125}$

D. $\frac{128}{125}$

A population grows continuously according to the formula $P = P_0 e^{kt}$, where $P$ is the final population at the end of $t$ years, $P_0$ is the initial population, and $k$ is the annual growth rate. What will the population be at the end of 10 years if the initial population is 5000 and the annual growth rate is 3%?

A. 6 720
B. 6 749
C. 51 523
D. 100 428

For what values of $x$ $(x \neq 0)$ will the following infinite geometric series have a finite sum?

$$x + 3x^2 + 9x^3 + \ldots$$

A. $-3 < x < 0$

B. $-\frac{1}{3} < x < \frac{1}{3}$

C. $-1 < x < 1$

D. $-3 < x < 3$

In 1872, Washington State experienced an earthquake of magnitude 6.8 on the Richter scale. Determine the magnitude on the Richter scale of an earthquake that is half as intense as the Washington State earthquake.

A. 3.4
B. 6.0
C. 6.5
D. 7.1

Change $\log_2(3x) = 5$ to exponential form.

A. $3x = 2^5$

B. $3x = 5^2$

C. $2 = (3x)^5$

D. $2 = 3x^5$

The graph of $f(x) = b^x$ and the graph of $g(x) = \left(\frac{1}{b}\right)^x$, where $b > 0$, are reflections of each other about the line

**A.** $y = x$
**B.** $y = b$
**C.** $x = 0$
**D.** $y = 0$

The expression $\log_{\frac{1}{5}}\left(\frac{1}{x}\right)$ is equivalent to

**A.** $\log_5\left(\frac{1}{x}\right)$

**B.** $\log_{\frac{1}{x}} 5$

**C.** $\log(5x)$

**D.** $\log_5 x$

If $xy = 8$, then to the nearest tenth, the value of $5\log_2 x + 5\log_2 y$ is ___

The expression $\log_x\left(y^3z\right) - \log_x\left(yz^2\right)$ is equivalent to

**A.** $\log_x\left(y^2z^3\right)$

**B.** $\log_x\left(\frac{y^2}{z}\right)$

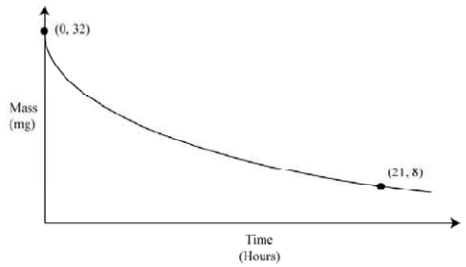
**C.** $3\log_x y + \log_x z - \log_x y + 2\log_x z$

**D.** 1

The half-life of the radioactive sample, in minutes, is

**A.** 60
**B.** 420
**C.** 630
**D.** 1260

The mass of a radioactive sample is represented in the graph below. The initial mass of 32 mg decays to 8 mg after 21 hours.




The value of $b$ in the equation $7 = (3+b)^4$ is equivalent to

**A.** $\frac{\log 7}{3^4}$

**B.** $\frac{\log_4 7}{\log_4 3}$

**C.** $7^4 - 3$

**D.** $\sqrt[4]{7} - 3$

Given $a^{5x} = \left(\log_c c^a\right)^{3x+8}$, the value of $x$, to the nearest hundredth is

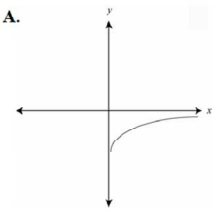
If the graph of $g(x)=\log_4 x$ undergoes the transformation $y=g(3x-12)+2$, the new domain of the graph is

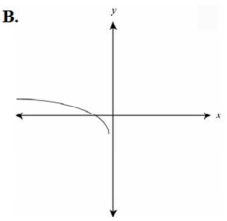
**A.** $x>2$
**B.** $x>3$
**C.** $x>4$
**D.** $x>12$

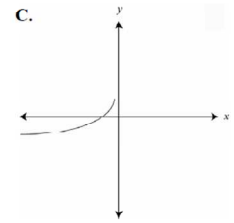
The domain of this graph is $f(x)=\log_x(6-x)$

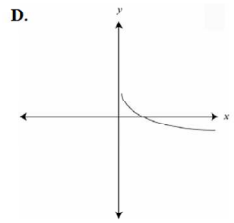
**A.** $x<0$
**B.** $x<6$
**C.** $0<x<6,\ x\neq 1$
**D.** $1<x<6$

The equation $4^{-2y}=x$ is represented by graph

**A.**


**B.**


**C.**


**D.**


Given the equation $\log_a x+y=\log_a z$, an expression for $y$ is

**A.** $y=\log_a\left(\frac{x}{z}\right)$
**B.** $y=\log_a\left(\frac{z}{x}\right)$
**C.** $y=\log_a(z-x)$
**D.** $y=z-x$

Given the equation $a^{\frac{5}{4}}=2b$, an expression for $a$ is

**A.** $2b^{\frac{4}{5}}$
**B.** $(2b)^{\frac{4}{5}}$
**C.** $2b^{-\frac{4}{5}}$
**D.** $\frac{1}{(2b)^{\frac{4}{5}}}$

The population of a city can be determined using the equation $P=100000(1.03)^t$ where $P$ is the future population, and $t$ is the time in years.
An equation representing $t$ as a function of $P$ is

**A.** $t=\frac{P}{103000}$
**B.** $t=\log P-5-\log 1.03$
**C.** $t=\frac{\log P}{5\log 1.03}$
**D.** $t=\frac{\log P-5}{\log 1.03}$

A particular bacteria doubles every $P$ hours. If a bacterial culture starts with 60000 bacteria and has 93000 bacteria after 3 hours, determine the doubling period.

The population of a town triples every 8 years. Determine the number of years it will take for the population to double.