Logarithmic Functions: Chapter 7

Practice Questions	**Notes**
1. Write $\log_b x = y$ in its equivalent exponent form. A) $y = x^b$ B) $x = b^y$ C) $b = x^y$ D) $y = b^x$	B
2. When the equation $23^x = 29$ is written in logarithmic form, the value of the base is _____.	23
3. Written as a single logarithm, the expression $2\log_a x - 3\log_a y + 4\log_a z$ can be expressed as _____. A) $\log_a(x^2 z^4 y^3)$ B) $\log_a\left(\dfrac{x^2 z^4}{y^3}\right)$ C) $\log_a\left(\dfrac{x^2 y^3}{z^4}\right)$ D) $\log_a\left(\dfrac{x^2}{y^3 z^4}\right)$	B

	D

4. The quotient law of logarithms states that $\log_5\left(\frac{18}{7}\right) =$ _____ .

       A) $\log_5 11$
       B) $\log_5 25$
       C) $\log_5 18 + \log_5 7$
       D) $\log_5 18 - \log_5 7$

	A

5. The x intercept of the graph of the function $y = \log_{\frac{1}{3}} x$ is:

       A) $x = 1$

       B) $c = \frac{1}{3}$

       C) $x = -1$

       D) $x = -\frac{1}{3}$

	2

6. The value of $\log_{25} 625$ is _____ .

7. *Use the following information to answer the question.*

When objects of different masses are compared without a scale, to be perceived the difference in mass must be large enough. For example, when held in a person's hands, different masses within 5 g of 100 g will seem to be the same. The 5 g difference is known as the Minimum Perceivable Difference.

For heavier objects, the Minimum Perceivable Difference increases. The Minimum Perceivable Differences for various masses are shown in the table below.

Mass (g)	Minimum Perceivable Difference (g)
100	5
200	10
400	15
800	20

These data can be modelled by a logarithmic regression function of the form

$$y = a + b \ln x$$

where x is the mass of the object, in grams, and y is the Minimum Perceivable Difference in mass, in grams.

Determine a logarithmic regression function of the form $y = a + b \ln x$ to model these data. Round values of a and b to the nearest tenth.

Based on the regression equation, determine the Minimum Perceivable Difference, to the nearest gram, for an object with a mass of 2 100 g.

$y = -28.2 + 7.2 lnx$

27 g

8. Which of the following equations is equivalent to $4^{x+2} = 16$
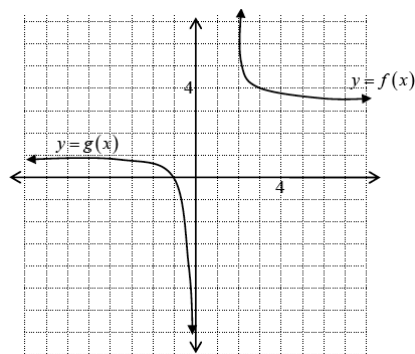
A. $\log_{(x+2)} 4 = 16$

B. $\log_{(x+2)} 16 = 4$

C. $\log_4 (x+2) = 16$

D. $\log_4 16 = x + 2$

D

9. A culture of bacteria triples every hour. How long does it take the bacteria culture to grow from 245 cells to 89 425 cells, to the nearest hundredth? _____	5.37
10. The graphs of two functions are shown. The equation of the function $y = f(x)$ could be: A) $y = \log(x - 2) + 4$ B) $y = \log(x + 2) + 4$ C) $y = -\log(x - 2) + 4$ D) $y = -\log(x + 2) + 4$	C
11. The pH of a solution can be determined using the formula $$pH = -\log_{10} [H_3O^+]$$ where $[H_3O^+]$ is the concentration of hydronium ions in the solution. The pH of a particular solution is 6.6. If the concentration of hydronium ions in the solution is doubled, the new pH of the solution, to the nearest tenth, will be _____.	6.3