

## General Algebra II Worksheet #3 Unit 12 Selected Solutions

Given:  $\text{Log}_N 2 = a$  ;  $\text{Log}_N 3 = b$  ;  $\text{Log}_N 5 = c$ .

Express each of the following logarithms as an algebraic expression in terms of a, b, and/or c.

2.  $\text{Log}_N 32 = \underline{5a}$

$$\text{Log}_N 2^5 = 5 \text{Log}_N 2$$

4.  $\text{Log}_N 200 = \underline{3a + 2c}$

$$\text{Log}_N (2^3 \cdot 5^2) = 3\text{Log}_N 2 + 2\text{Log}_N 5$$

6.  $\text{Log}_N 0.5 = \underline{-a}$

$$\text{Log}_N (1/2) = -\text{Log}_N 2$$

8.  $\text{Log}_N 0.04 = \underline{-2c}$

$$\text{Log}_N (1/5^2) = -2\text{Log}_N 5$$

10.  $\text{Log}_N 1.2 = \underline{a + b - c}$

$$\text{Log}_N (6/5) = \text{Log}_N 2 + \text{Log}_N 3 - \text{Log}_N 5$$

12.  $\text{Log}_N (2N^3) = \underline{a + 3}$

$$\text{Log}_N 2 + 3\text{Log}_N N$$

14.  $\text{Log}_N \sqrt{10} = \underline{\frac{a + c}{2}}$

$$\text{Log}_N 10^{0.5} = 0.5(\text{Log}_N 2 + \text{Log}_N 5)$$

16.  $\text{Log}_N \left(\frac{10}{9}\right) = \underline{a + c - 2b}$

$$= \text{Log}_N 10 - \text{Log}_N 9 =$$

$$= \text{Log}_N 2 + \text{Log}_N 5 - 2\text{Log}_N 3$$

Evaluate each of the following.

18.  $\text{Log}_3 81 = \underline{4}$

$$81 = 3^4$$

20.  $\text{Log}_2 32 = \underline{5}$

$$32 = 2^5$$

22.  $\text{Log}_4 0.25 = \underline{-1}$

$$0.25 = 1/4 = 4^{-1}$$

24.  $\text{Log}_2 0.125 = \underline{-3}$

$$0.125 = 1/8 = 2^{-3}$$

26.  $\text{Log}_3 \sqrt[3]{9} = \underline{\frac{2}{3}}$

$$\sqrt[3]{9} = \sqrt[3]{3^2} = 3^{\frac{2}{3}}$$

