Algebra II
Lesson #2 Unit 11
Class Worksheet #2
For Worksheets #2 & #3

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We know that $B^0 = 1$.

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We know that $B^1 = B$.

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We know that $B^0 = 1$. Therefore, $\text{Log}_B 1 = 0$.

We know that $B^1 = B$. Therefore, $\text{Log}_B B = 1$.

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Suppose that $x = B^u$

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Suppose that $x = B^u$ and $y = B^v$.

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Suppose that $x = B^u$ and $y = B^v$. Then xy =

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Suppose that $x = B^u$ and $y = B^v$. Then $xy = (B^u)(B^v) = B^{u+v}$.

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$\text{Log}_B x =$

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$\text{Log}_B x = u$, $\text{Log}_B y = v$ and $\text{Log}_B(xy) =$

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Using the definition of logarithms, we can conclude

$\text{Log}_B\, x = u$, $\text{Log}_B\, y = v$ and $\text{Log}_B\,(xy) = u + v$.

Therefore, $\text{Log}_B\,(xy) = \text{Log}_B\, x$

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$$\text{Log}_B\, x = u,\ \text{Log}_B\, y = v \text{ and } \text{Log}_B\,(xy) = u + v.$$

$$\text{Therefore, } \text{Log}_B\,(xy) = \text{Log}_B\, x + \text{Log}_B\, y\ .$$

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Suppose that $x = B^u$ and $y = B^v$. Then $xy = (B^u)(B^v) = B^{u+v}$.
Using the definition of logarithms, we can conclude

$$\text{Log}_B x = u,\ \text{Log}_B y = v \text{ and } \text{Log}_B (xy) = u + v.$$

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Suppose that $x = B^u$ and $y = B^v$. Then $xy = (B^u)(B^v) = B^{u+v}$. Using the definition of logarithms, we can conclude

$\text{Log}_B x = u$, $\text{Log}_B y = v$ and $\text{Log}_B (xy) = u + v$.

Therefore, $\text{Log}_B (xy) = \text{Log}_B x + \text{Log}_B y$.

This is called the 'product rule'.

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The Product Rule: $\operatorname{Log}_B(xy) = \operatorname{Log}_B x + \operatorname{Log}_B y$

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The Product Rule: $\mathbf{Log_B(xy) = Log_B x + Log_B y}$

Consider the following application of the product rule.

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The Product Rule: $\mathrm{Log}_B(xy) = \mathrm{Log}_B x + \mathrm{Log}_B y$

Consider the following application of the product rule.

$\mathrm{Log}_B(x^2) =$

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Consider the following application of the product rule.

$$\mathrm{Log}_B(x^2) = \mathrm{Log}_B[(x)(x)] =$$

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$$\mathrm{Log}_B(x^2) = \mathrm{Log}_B[(x)(x)] = \mathrm{Log}_B x + \mathrm{Log}_B x$$

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The Product Rule: $\text{Log}_B(xy) = \text{Log}_B x + \text{Log}_B y$

Consider the following application of the product rule.

$$\text{Log}_B(x^2) = \text{Log}_B[(x)(x)] = \text{Log}_B x + \text{Log}_B x = 2\text{Log}_B x$$

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Consider the following application of the product rule.

$$\mathrm{Log}_B(x^2) = 2\mathrm{Log}_B x$$

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$\mathrm{Log}_B(x^3) =$

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Consider the following application of the product rule.

$$\mathrm{Log}_B(x^2) = 2\mathrm{Log}_B x$$

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Consider the following application of the product rule.

$$\mathrm{Log}_B(x^2) = 2\mathrm{Log}_B x$$

$$\mathrm{Log}_B(x^3) = \mathrm{Log}_B[(x)(x^2)] = \mathrm{Log}_B x + \mathrm{Log}_B(x^2)$$

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The Product Rule: $\mathbf{Log_B(xy) = Log_B x + Log_B y}$

Consider the following application of the product rule.

$$\mathbf{Log_B(x^2) = 2Log_B x}$$

$$\mathbf{Log_B(x^3) = Log_B[(x)(x^2)] = Log_B x + Log_B(x^2) =}$$

$$\mathbf{=}$$

$$\mathbf{B^k = N \quad \Rightarrow \quad log_B N = k}$$

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Consider the following application of the product rule.

$$\mathrm{Log}_B(x^2) = 2\mathrm{Log}_B x$$

$$\mathrm{Log}_B(x^3) = \mathrm{Log}_B[(x)(x^2)] = \mathrm{Log}_B x + \mathrm{Log}_B(x^2) =$$

$$= \mathrm{Log}_B x$$

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$$\text{Log}_B(x^3) = \text{Log}_B[(x)(x^2)] = \text{Log}_B x + \text{Log}_B(x^2) =$$

$$= \text{Log}_B x + 2\text{Log}_B x$$

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$$\mathrm{Log}_B(x^2) = 2\mathrm{Log}_B x$$

$$\mathrm{Log}_B(x^3) = \mathrm{Log}_B[(x)(x^2)] = \mathrm{Log}_B x + \mathrm{Log}_B(x^2) =$$

$$= \mathrm{Log}_B x + 2\mathrm{Log}_B x = 3\mathrm{Log}_B x$$

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$$\mathrm{Log}_B(x^3) = 3\mathrm{Log}_B x$$

$$B^k = N \longrightarrow \log_B N = k$$

This lesson will introduce and apply the <u>properties of logarithms</u>.

Because the log of a number is an exponent, the properties of logarithms are closely related to the properties of exponents. (Note: The base, B, of a logarithmic expression, must be <u>positive</u>.)

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In general, $\mathrm{Log}_B(x^n)$

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Because the log of a number is an exponent, the properties of logarithms are closely related to the properties of exponents. (Note: The base, B, of a logarithmic expression, must be <u>positive</u>.)

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In general, $\log_B(x^n) = n\log_B x$ **.**

$B^k = N \quad \Rightarrow \quad \log_B N = k$

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The Product Rule: $\text{Log}_B(xy) = \text{Log}_B x + \text{Log}_B y$

Consider the following application of the product rule.

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In general, $\text{Log}_B(x^n) = n\text{Log}_B x$.

This is called the power rule.

$$B^k = N \Rightarrow \log_B N = k$$

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The Product Rule: $\text{Log}_B(xy) = \text{Log}_B x + \text{Log}_B y$

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Therefore,

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Therefore, $\text{Log}_B\,(x/y) = \text{Log}_B\, x$

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$$B^k = N \quad \Longrightarrow \quad \log_B N = k$$

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$\text{Log}_B x = u$, $\text{Log}_B y = v$ and $\text{Log}_B (x/y) = u - v$.

Therefore, $\text{Log}_B (x/y) = \text{Log}_B x - \text{Log}_B y$.

This is called the 'quotient rule'.

$$B^k = N \longrightarrow \log_B N = k$$

This lesson will introduce and apply the <u>properties of logarithms</u>.

Because the log of a number is an exponent, the properties of logarithms are closely related to the properties of exponents. (Note: The base, B, of a logarithmic expression, must be <u>positive</u>.)

The Quotient Rule: $\mathrm{Log}_B(x/y) = \mathrm{Log}_B x - \mathrm{Log}_B y$

$B^k = N \quad \longrightarrow \quad \log_B N = k$

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$\mathrm{Log}_B(1/x)$

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Consider the following application of the quotient rule.

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The Quotient Rule: $\mathbf{Log_B(x/y) = Log_B x - Log_B y}$

Consider the following application of the quotient rule.

$$\mathbf{Log_B(1/x) = Log_B 1 - Log_B x}$$

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Consider the following application of the quotient rule.

$$\text{Log}_B(1/x) = \text{Log}_B 1 - \text{Log}_B x = 0$$

$$B^k = N \quad \Rightarrow \quad \log_B N = k$$

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$$\mathrm{Log}_B(1/x) = \mathrm{Log}_B 1 - \mathrm{Log}_B x = 0 - \mathrm{Log}_B x = -\mathrm{Log}_B x$$

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Therefore,

$$B^k = N \quad \Rightarrow \quad \log_B N = k$$

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$$\mathrm{Log}_B(1/x) = \mathrm{Log}_B 1 - \mathrm{Log}_B x = 0 - \mathrm{Log}_B x = -\mathrm{Log}_B x$$

Therefore, $\mathrm{Log}_B(1/x)$

$$B^k = N \quad \Rightarrow \quad \log_B N = k$$

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Therefore, $\mathbf{Log_B(1/x) =}$

$$\mathbf{B^k = N \Rightarrow \log_B N = k}$$

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Therefore, $\mathrm{Log}_B(1/x) = -\mathrm{Log}_B x$.

$$B^k = N \quad \Longrightarrow \quad \log_B N = k$$

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The Quotient Rule: $\operatorname{Log}_B(x/y) = \operatorname{Log}_B x - \operatorname{Log}_B y$

Consider the following application of the quotient rule.

$$\operatorname{Log}_B(1/x) = \operatorname{Log}_B 1 - \operatorname{Log}_B x = 0 - \operatorname{Log}_B x = -\operatorname{Log}_B x$$

Therefore, $\operatorname{Log}_B(1/x) = -\operatorname{Log}_B x$ **.**

This is called the reciprocal rule.

$B^k = N \longrightarrow \log_B N = k$

This lesson will introduce and apply the **properties of logarithms**.

Because the log of a number is an exponent, the properties of logarithms are closely related to the properties of exponents. (Note: The base, B, of a logarithmic expression, must be **positive**.)

The Quotient Rule: $\text{Log}_B(x/y) = \text{Log}_B x - \text{Log}_B y$

The Reciprocal Rule: $\text{Log}_B(1/x) = -\text{Log}_B x$

$B^k = N \longrightarrow \log_B N = k$

The Properties of Logarithms

$\text{Log}_B B = 1$

$\text{Log}_B 1 = 0$

The Product Rule: $\text{Log}_B(xy) = \text{Log}_B x + \text{Log}_B y$

The Power Rule: $\text{Log}_B(x^n) = n\text{Log}_B x$

The Quotient Rule: $\text{Log}_B(x/y) = \text{Log}_B x - \text{Log}_B y$

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Next we will introduce <u>common logarithm</u> and <u>natural logarithm</u>.

$$\log_B N = k \Longrightarrow B^k = N$$

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Common logarithm is log base 10.

$$\log_B N = k \Rightarrow B^k = N$$

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Common logarithm is log base 10. The common logarithm of 100 is written as Log 100.

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Next we will introduce <u>common logarithm</u> and <u>natural logarithm</u>.

Common logarithm is log base 10. The common logarithm of 100 is written as Log 100. Notice that the base is not written.

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Common logarithm is log base 10. The common logarithm of 100 is written as Log 100. Notice that the base is not written. Clearly, since $100 = 10^2$,

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Next we will introduce common logarithm and natural logarithm.

Common logarithm is log base 10. The common logarithm of 100 is written as Log 100. Notice that the base is not written. Clearly, since $100 = 10^2$, Log 100 = 2.

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Common logarithm is log base 10. The common logarithm of 100 is written as Log 100. Notice that the base is not written. Clearly, since $100 = 10^2$, Log 100 = 2. If a number, k, is a power of 10, then Log k (the common logarithm of k) 'comes out even'.

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Common logarithm is log base 10. The common logarithm of 100 is written as Log 100. Notice that the base is not written. Clearly, since $100 = 10^2$, Log 100 = 2. If a number, k, is a power of 10, then Log k (the common logarithm of k) 'comes out even'. If k is not a power of 10, however, a calculator can be used to approximate Log k. For example Log 200, using a calculator, is approximately 2.3. This implies that $10^{2.3} \approx 200$

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For example ln 200, using a calculator, is approximately 5.3.

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For example ln 200, using a calculator, is approximately 5.3. This implies that $e^{5.3} \approx 200$.

$$\log_B N = k \quad \Longrightarrow \quad B^k = N$$

Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\text{Log}_B B =$ ______

2. $\text{Log}_B 1 =$ ______

3. $\text{Log}_B (mn) =$ ________________

4. $\text{Log}_B (m^n) =$ ________________

5. $\text{Log}_B \left(\frac{m}{n}\right) =$ ________________

6. $\text{Log}_B \left(\frac{1}{n}\right) =$ ________________

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5. $\text{Log}_B \left(\frac{m}{n}\right) = \underline{\qquad\qquad\qquad\qquad}$

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4. $\text{Log}_B (m^n) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_$

5. $\text{Log}_B \left(\frac{m}{n}\right) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_$

6. $\text{Log}_B \left(\frac{1}{n}\right) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_$

Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\log_B B =$ <u>1</u>

2. $\log_B 1 =$ <u>0</u>

3. $\log_B (mn) =$ ________________

4. $\log_B (m^n) =$ ________________

5. $\log_B \left(\frac{m}{n}\right) =$ ________________

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Complete each of the following properties of logarithms.

1. $\text{Log}_B B = $ **1**

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3. $\text{Log}_B (mn) = $ ________________

4. $\text{Log}_B (m^n) = $ ________________

5. $\text{Log}_B \left(\frac{m}{n}\right) = $ ________________

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Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\log_B B =$ **1**

2. $\log_B 1 =$ **0**

3. $\log_B (mn) =$ $\log_B m$ ______________

4. $\log_B (m^n) =$ ______________

5. $\log_B \left(\frac{m}{n}\right) =$ ______________

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4. $\text{Log}_B(m^n) = \underline{\qquad\qquad\qquad}$

5. $\text{Log}_B\left(\frac{m}{n}\right) = \underline{\qquad\qquad\qquad}$

6. $\text{Log}_B\left(\frac{1}{n}\right) = \underline{\qquad\qquad\qquad}$

Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\log_B B =$ **1**

2. $\log_B 1 =$ **0**

3. $\log_B (mn) = \log_B m + \log_B n$

4. $\log_B (m^n) =$ ________________

5. $\log_B \left(\frac{m}{n}\right) =$ ________________

6. $\log_B \left(\frac{1}{n}\right) =$ ________________

Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\log_B B = \underline{\ 1\ }$

2. $\log_B 1 = \underline{\ 0\ }$

3. $\log_B(mn) = \underline{\log_B m + \log_B n}$

4. $\log_B(m^n) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_$

5. $\log_B\left(\frac{m}{n}\right) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_$

6. $\log_B\left(\frac{1}{n}\right) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_$

Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\text{Log}_B B =$ **1**

2. $\text{Log}_B 1 =$ **0**

3. $\text{Log}_B(mn) =$ $\text{Log}_B m + \text{Log}_B n$

4. $\text{Log}_B(m^n) =$ ______________

5. $\text{Log}_B\left(\frac{m}{n}\right) =$ ______________

6. $\text{Log}_B\left(\frac{1}{n}\right) =$ ______________

Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\text{Log}_B B =$ __1__

2. $\text{Log}_B 1 =$ __0__

3. $\text{Log}_B(mn) =$ $\text{Log}_B m + \text{Log}_B n$

4. $\text{Log}_B(m^n) =$ $n\,\text{Log}_B m$

5. $\text{Log}_B\left(\frac{m}{n}\right) =$ ________________

6. $\text{Log}_B\left(\frac{1}{n}\right) =$ ________________

Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\text{Log}_B B = $ 1

2. $\text{Log}_B 1 = $ 0

3. $\text{Log}_B(mn) = $ $\text{Log}_B m + \text{Log}_B n$

4. $\text{Log}_B(m^n) = $ $n\,\text{Log}_B m$

5. $\text{Log}_B\left(\frac{m}{n}\right) = $ ______________

6. $\text{Log}_B\left(\frac{1}{n}\right) = $ ______________

Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\text{Log}_B B = \underline{\ 1\ }$

2. $\text{Log}_B 1 = \underline{\ 0\ }$

3. $\text{Log}_B(mn) = \underline{\text{Log}_B m + \text{Log}_B n}$

4. $\text{Log}_B(m^n) = \underline{n\,\text{Log}_B m}$

5. $\text{Log}_B\left(\frac{m}{n}\right) =$ ______________

6. $\text{Log}_B\left(\frac{1}{n}\right) =$ ______________

Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\log_B B =$ 1

2. $\log_B 1 =$ 0

3. $\log_B(mn) = \log_B m + \log_B n$

4. $\log_B(m^n) = n\log_B m$

5. $\log_B\left(\frac{m}{n}\right) = \log_B m$ ______

6. $\log_B\left(\frac{1}{n}\right) =$ ______

Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\text{Log}_B B = $ __1__

2. $\text{Log}_B 1 = $ __0__

3. $\text{Log}_B (mn) = $ __$\text{Log}_B m + \text{Log}_B n$__

4. $\text{Log}_B (m^n) = $ __$n\,\text{Log}_B m$__

5. $\text{Log}_B \left(\frac{m}{n}\right) = $ __$\text{Log}_B m -$__

6. $\text{Log}_B \left(\frac{1}{n}\right) = $ ______________

Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\log_B B = \underline{\;1\;}$

2. $\log_B 1 = \underline{\;0\;}$

3. $\log_B (mn) = \underline{\log_B m + \log_B n}$

4. $\log_B (m^n) = \underline{n \log_B m}$

5. $\log_B \left(\frac{m}{n}\right) = \underline{\log_B m - \log_B n}$

6. $\log_B \left(\frac{1}{n}\right) =$ _______________

Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\text{Log}_B B = \underline{\quad 1 \quad}$

2. $\text{Log}_B 1 = \underline{\quad 0 \quad}$

3. $\text{Log}_B (mn) = \underline{\text{Log}_B m + \text{Log}_B n}$

4. $\text{Log}_B (m^n) = \underline{n \text{Log}_B m}$

5. $\text{Log}_B \left(\frac{m}{n}\right) = \underline{\text{Log}_B m - \text{Log}_B n}$

6. $\text{Log}_B \left(\frac{1}{n}\right) = \_\_\_\_\_\_\_\_\_\_\_\_$

Algebra II Class Worksheet #2 Unit 11

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1. $\text{Log}_B B = \underline{\ 1\ }$

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3. $\text{Log}_B(mn) = \underline{\text{Log}_B m + \text{Log}_B n}$

4. $\text{Log}_B(m^n) = \underline{n \text{Log}_B m}$

5. $\text{Log}_B\left(\frac{m}{n}\right) = \underline{\text{Log}_B m - \text{Log}_B n}$

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Algebra II Class Worksheet #2 Unit 11

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5. $\log_B\left(\frac{m}{n}\right) = \underline{\log_B m - \log_B n}$

6. $\log_B\left(\frac{1}{n}\right) = \underline{-\log_B n}$

Algebra II Class Worksheet #2 Unit 11

Complete each of the following properties of logarithms.

1. $\log_B B =$ **1**

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3. $\log_B(mn) =$ $\log_B m + \log_B n$

4. $\log_B(m^n) =$ $n\log_B m$

5. $\log_B\left(\frac{m}{n}\right) =$ $\log_B m - \log_B n$

6. $\log_B\left(\frac{1}{n}\right) =$ $-\log_B n$

Algebra II Class Worksheet #2 Unit 11

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4. $\text{Log}_B(m^n) = \underline{n\,\text{Log}_B m}$

5. $\text{Log}_B\left(\frac{m}{n}\right) = \underline{\text{Log}_B m - \text{Log}_B n}$

6. $\text{Log}_B\left(\frac{1}{n}\right) = \underline{-\text{Log}_B n}$

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 =$ __________

8. $\text{Log}_N 125 =$ __________

9. $\text{Log}_N 12 =$ __________

10. $\text{Log}_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

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8. $\text{Log}_N 125 =$ ___________

9. $\text{Log}_N 12 =$ ___________

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8. $\log_N 125 =$ __________

9. $\log_N 12 =$ __________

10. $\log_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 =$ __________

=

8. $\text{Log}_N 125 =$ __________

9. $\text{Log}_N 12 =$ __________

10. $\text{Log}_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 =$ __________

$= \text{Log}_N [(3)(5)]$

8. $\text{Log}_N 125 =$ __________

9. $\text{Log}_N 12 =$ __________

10. $\text{Log}_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 =$ ___________

$= \text{Log}_N [(3)(5)] =$

$=$

8. $\text{Log}_N 125 =$ ___________

9. $\text{Log}_N 12 =$ ___________

10. $\text{Log}_N 0.75 =$ ___________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 =$ ___________

$= \text{Log}_N [(3)(5)] =$

$= \text{Log}_N 3$

8. $\text{Log}_N 125 =$ ___________

9. $\text{Log}_N 12 =$ ___________

10. $\text{Log}_N 0.75 =$ ___________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 =$ ___________

$= \text{Log}_N [(3)(5)] =$

$= \text{Log}_N 3 +$

8. $\text{Log}_N 125 =$ ___________

9. $\text{Log}_N 12 =$ ___________

10. $\text{Log}_N 0.75 =$ ___________

Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\log_N 15 =$ __________

$= \log_N [(3)(5)] =$

$= \log_N 3 + \log_N 5$

8. $\log_N 125 =$ __________

9. $\log_N 12 =$ __________

10. $\log_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 =$ __________

$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ __________

9. $\text{Log}_N 12 =$ __________

10. $\text{Log}_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 =$ __b________

$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ __________

9. $\text{Log}_N 12 =$ __________

10. $\text{Log}_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\log_N 15 =$ __b +______

$= \log_N [(3)(5)] =$

$= \log_N 3 + \log_N 5 =$

8. $\log_N 125 =$ __________

9. $\log_N 12 =$ __________

10. $\log_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 = \underline{\quad b + c \quad}$

$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ __________

9. $\text{Log}_N 12 =$ __________

10. $\text{Log}_N 0.75 =$ __________

Algebra II   Class Worksheet #2   Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

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Algebra II Class Worksheet #2 Unit 11

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Algebra II Class Worksheet #2 Unit 11

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8. $\log_N 125 =$ ___________

$=$

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10. $\log_N 0.75 =$ ___________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 =$ **b + c**

$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ ___________

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

9. $\text{Log}_N 12 =$ ___________

10. $\text{Log}_N 0.75 =$ ___________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 =$ b + c

$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ __________

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

$=$

9. $\text{Log}_N 12 =$ __________

10. $\text{Log}_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

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$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ ___________

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

$= 3\,\text{Log}_N 5$

9. $\text{Log}_N 12 =$ ___________

10. $\text{Log}_N 0.75 =$ ___________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

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$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ ____________

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

$= 3\,\text{Log}_N 5 =$

9. $\text{Log}_N 12 =$ ____________

10. $\text{Log}_N 0.75 =$ ____________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 = $ **b + c**

$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 = $ **3c**

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

$= 3\,\text{Log}_N 5 =$

9. $\text{Log}_N 12 = $ __________

10. $\text{Log}_N 0.75 = $ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 =$ __b + c__

$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ __3c__

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

$= 3\,\text{Log}_N 5 =$

9. $\text{Log}_N 12 =$ ___________

10. $\text{Log}_N 0.75 =$ ___________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. **Express each of the following using an algebraic expression in terms of a, b, and/or c.**

7. $\text{Log}_N 15 =$ b + c

$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ 3c

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

$= 3\,\text{Log}_N 5 =$

9. $\text{Log}_N 12 =$ __________

10. $\text{Log}_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\log_N 15 =$ __b + c__

$= \log_N [(3)(5)] =$

$= \log_N 3 + \log_N 5 =$

8. $\log_N 125 =$ __3c__

$= \log_N (5^3) =$

$= 3\log_N 5 =$

9. $\log_N 12 =$ ___________

$=$

10. $\log_N 0.75 =$ ___________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. **Express each of the following using an algebraic expression in terms of a, b, and/or c.**

7. $\text{Log}_N 15 =$ **b + c**

$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ **3c**

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

$= 3\,\text{Log}_N 5 =$

9. $\text{Log}_N 12 =$ ___________

$= \text{Log}_N [(2^2)(3)]$

10. $\text{Log}_N 0.75 =$ ___________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. **Express each of the following using an algebraic expression in terms of a, b, and/or c.**

7. $\text{Log}_N 15 =$ **b + c**

$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ **3c**

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

$= 3\,\text{Log}_N 5 =$

9. $\text{Log}_N 12 =$ ___________

$= \text{Log}_N [(2^2)(3)] =$

$=$

10. $\text{Log}_N 0.75 =$ ___________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 =$ ___b + c___

$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ ___3c___

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

$= 3\,\text{Log}_N 5 =$

9. $\text{Log}_N 12 =$ __________

$= \text{Log}_N [(2^2)(3)] =$

$= \text{Log}_N (2^2)$

10. $\text{Log}_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. **Express each of the following using an algebraic expression in terms of a, b, and/or c.**

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$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ ___3c___

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

$= 3\,\text{Log}_N 5 =$

9. $\text{Log}_N 12 =$ __________

$= \text{Log}_N [(2^2)(3)] =$

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

10. $\text{Log}_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\log_N 15 =$ **b + c**

$= \log_N [(3)(5)] =$

$= \log_N 3 + \log_N 5 =$

8. $\log_N 125 =$ **3c**

$= \log_N (5^3) =$

$= 3\log_N 5 =$

9. $\log_N 12 =$ ___________

$= \log_N [(2^2)(3)] =$

$= \log_N (2^2) + \log_N 3$

10. $\log_N 0.75 =$ ___________

Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

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$= \log_N [(3)(5)] =$

$= \log_N 3 + \log_N 5 =$

8. $\log_N 125 =$ __3c__

$= \log_N (5^3) =$

$= 3 \log_N 5 =$

9. $\log_N 12 =$ __________

$= \log_N [(2^2)(3)] =$

$= \log_N (2^2) + \log_N 3 =$

$=$

10. $\log_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. **Express each of the following using an algebraic expression in terms of a, b, and/or c.**

7. $\text{Log}_N 15 =$ **b + c**

$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ **3c**

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

$= 3\,\text{Log}_N 5 =$

9. $\text{Log}_N 12 =$ __________

$= \text{Log}_N [(2^2)(3)] =$

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

$= 2\,\text{Log}_N 2$

10. $\text{Log}_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\text{Log}_N 15 =$ ___b + c___

$= \text{Log}_N [(3)(5)] =$

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

8. $\text{Log}_N 125 =$ ___3c___

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

$= 3\,\text{Log}_N 5 =$

9. $\text{Log}_N 12 =$ __________

$= \text{Log}_N [(2^2)(3)] =$

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

$= 2\,\text{Log}_N 2 +$

10. $\text{Log}_N 0.75 =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

7. $\log_N 15 =$ __b + c__

$= \log_N [(3)(5)] =$

$= \log_N 3 + \log_N 5 =$

8. $\log_N 125 =$ __3c__

$= \log_N (5^3) =$

$= 3\log_N 5 =$

9. $\log_N 12 =$ __________

$= \log_N [(2^2)(3)] =$

$= \log_N (2^2) + \log_N 3 =$

$= 2\log_N 2 + \log_N 3$

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9. $\log_N 12 =$ __2a__

$= \log_N [(2^2)(3)] =$

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$= 3\,\text{Log}_N 5 =$

9. $\text{Log}_N 12 =$ 2a +

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$=$

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Algebra II Class Worksheet #2 Unit 11

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$=$

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10. $\log_N 0.75 =$ ____________

$= \log_N [(3)/(2^2)] =$

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$= \text{Log}_N [(3)/(2^2)] =$

$= \text{Log}_N 3 - \text{Log}_N (2^2)$

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

$= 2\,\text{Log}_N 2 + \text{Log}_N 3 =$

10. $\text{Log}_N 0.75 =$ ___________

$= \text{Log}_N [(3)/(2^2)] =$

$= \text{Log}_N 3 - \text{Log}_N (2^2) =$

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$= 3\,\text{Log}_N 5 =$

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$= \text{Log}_N [(2^2)(3)] =$

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

$= 2\,\text{Log}_N 2 + \text{Log}_N 3 =$

10. $\text{Log}_N 0.75 = $ __b__

$= \text{Log}_N [(3)/(2^2)] =$

$= \text{Log}_N 3 - \text{Log}_N (2^2) =$

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10. $\text{Log}_N 0.75 =$ ___b –___

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

$= 2\,\text{Log}_N 2 + \text{Log}_N 3 =$

10. $\text{Log}_N 0.75 =$ __b – 2a__

$= \text{Log}_N [(3)/(2^2)] =$

$= \text{Log}_N 3 - \text{Log}_N (2^2) =$

$= \text{Log}_N 3 - 2\,\text{Log}_N 2 =$

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$= \text{Log}_N 3 - \text{Log}_N (2^2) =$

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Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\log_N (3N^3) =$ __________

12. $\log_N 0.125 =$ __________

13. $\log_N 0.6 =$ __________

14. $\log_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

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11. $\log_N (3N^3) =$ ___________

$= \log_N 3 +$

12. $\log_N 0.125 =$ ___________

13. $\log_N 0.6 =$ ___________

14. $\log_N \sqrt{6} =$ __________

Algebra II   Class Worksheet #2   Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

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$= \log_N 3 + \log_N (N^3)$

12. $\log_N 0.125 =$ __________

13. $\log_N 0.6 =$ __________

14. $\log_N \sqrt{6} =$ _________

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14. $\log_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. **Express each of the following using an algebraic expression in terms of a, b, and/or c.**

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$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3$

12. $\text{Log}_N 0.125 =$ __________

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$= \text{Log}_N 3 +$

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Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\text{Log}_N(3N^3) =$ __________

$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N$

12. $\text{Log}_N 0.125 =$ __________

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N \sqrt{6} =$ _________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\text{Log}_N (3N^3) =$ __________

$= \text{Log}_N 3 + \text{Log}_N (N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$=$

12. $\text{Log}_N 0.125 =$ __________

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N \sqrt{6} =$ _________

Algebra II Class Worksheet #2 Unit 11

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$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3$

12. $\text{Log}_N 0.125 =$ __________

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N \sqrt{6} =$ _________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

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$= \text{Log}_N 3 + \text{Log}_N (N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 +$

12. $\text{Log}_N 0.125 =$ __________

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N \sqrt{6} =$ _________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. **Express each of the following using an algebraic expression in terms of a, b, and/or c.**

11. $\text{Log}_N (3N^3) =$ ___________

$= \text{Log}_N 3 + \text{Log}_N (N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1)$

12. $\text{Log}_N 0.125 =$ ___________

13. $\text{Log}_N 0.6 =$ ___________

14. $\text{Log}_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\text{Log}_N(3N^3) =$ ___________

$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ ___________

13. $\text{Log}_N 0.6 =$ ___________

14. $\text{Log}_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\log_N(3N^3) =$ __b__________

$= \log_N 3 + \log_N(N^3) =$

$= \log_N 3 + 3\log_N N =$

$= \log_N 3 + 3(1) =$

12. $\log_N 0.125 =$ ___________

13. $\log_N 0.6 =$ ___________

14. $\log_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\text{Log}_N(3N^3) =$ __b +____

$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ __________

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N \sqrt{6} =$ _________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\text{Log}_N (3N^3) =$ __b + 3__

$= \text{Log}_N 3 + \text{Log}_N (N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ __________

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\text{Log}_N (3N^3) =$ __ b + 3 __

$= \text{Log}_N 3 + \text{Log}_N (N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ __________

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\log_N (3N^3) =$ __b + 3__

$= \log_N 3 + \log_N (N^3) =$

$= \log_N 3 + 3\log_N N =$

$= \log_N 3 + 3(1) =$

12. $\log_N 0.125 =$ __________

13. $\log_N 0.6 =$ __________

14. $\log_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\text{Log}_N(3N^3) =$ __ b + 3 __

$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ __________

$=$

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N\sqrt{6} =$ _________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\text{Log}_N (3N^3) =$ **b + 3**

$= \text{Log}_N 3 + \text{Log}_N (N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ __________

$= \text{Log}_N (1/8)$

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. **Express each of the following using an algebraic expression in terms of a, b, and/or c.**

11. $\text{Log}_N(3N^3) =$ __ b + 3 __

$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ __________

$= \text{Log}_N(1/8) =$

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N\sqrt{6} =$ __________

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$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ ___________

$= \text{Log}_N(1/8) = \text{Log}_N(1/2^3)$

13. $\text{Log}_N 0.6 =$ ___________

14. $\text{Log}_N\sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

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$= \text{Log}_N 3 + \text{Log}_N (N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ ___________

$= \text{Log}_N (1/8) = \text{Log}_N (1/2^3) =$

$=$

13. $\text{Log}_N 0.6 =$ ___________

14. $\text{Log}_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\log_N(3N^3) =$ **b + 3**

$= \log_N 3 + \log_N(N^3) =$

$= \log_N 3 + 3\log_N N =$

$= \log_N 3 + 3(1) =$

12. $\log_N 0.125 =$ ___________

$= \log_N(1/8) = \log_N(1/2^3) =$

$= \log_N 1$

13. $\log_N 0.6 =$ ___________

14. $\log_N \sqrt{6} =$ _________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

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$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ __________

$= \text{Log}_N(1/8) = \text{Log}_N(1/2^3) =$

$= \text{Log}_N 1 -$

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N\sqrt{6} =$ __________

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$= \text{Log}_N 3 + \text{Log}_N (N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ ___________

$= \text{Log}_N (1/8) = \text{Log}_N (1/2^3) =$

$= \text{Log}_N 1 - \text{Log}_N (2^3)$

13. $\text{Log}_N 0.6 =$ ___________

14. $\text{Log}_N \sqrt{6} =$ _________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

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$= \text{Log}_N 3 + \text{Log}_N (N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ __________

$= \text{Log}_N (1/8) = \text{Log}_N (1/2^3) =$

$= \text{Log}_N 1 - \text{Log}_N (2^3) =$

$=$

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

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$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ ___________

$= \text{Log}_N(1/8) = \text{Log}_N(1/2^3) =$

$= \text{Log}_N 1 - \text{Log}_N(2^3) =$

$= 0$

13. $\text{Log}_N 0.6 =$ ___________

14. $\text{Log}_N \sqrt{6} =$ _________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

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$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 = $ ___________

$= \text{Log}_N(1/8) = \text{Log}_N(1/2^3) =$

$= \text{Log}_N 1 - \text{Log}_N(2^3) =$

$= 0 -$

13. $\text{Log}_N 0.6 = $ ___________

14. $\text{Log}_N\sqrt{6} = $ _________

Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\log_N(3N^3) =$ **b + 3**

$= \log_N 3 + \log_N(N^3) =$

$= \log_N 3 + 3\log_N N =$

$= \log_N 3 + 3(1) =$

12. $\log_N 0.125 =$ ___________

$= \log_N(1/8) = \log_N(1/2^3) =$

$= \log_N 1 - \log_N(2^3) =$

$= 0 - 3\log_N 2$

13. $\log_N 0.6 =$ ___________

14. $\log_N\sqrt{6} =$ _________

Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. **Express each of the following using an algebraic expression in terms of a, b, and/or c.**

11. $\log_N(3N^3) = $ $\underline{\quad b + 3 \quad}$

$= \log_N 3 + \log_N(N^3) =$

$= \log_N 3 + 3\log_N N =$

$= \log_N 3 + 3(1) =$

12. $\log_N 0.125 = $ ____________

$= \log_N(1/8) = \log_N(1/2^3) =$

$= \log_N 1 - \log_N(2^3) =$

$= 0 - 3\log_N 2 =$

13. $\log_N 0.6 = $ ____________

14. $\log_N \sqrt{6} = $ ___________

Algebra II Class Worksheet #2 Unit 11

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$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ __________

$= \text{Log}_N(1/8) = \text{Log}_N(1/2^3) =$

$= \text{Log}_N 1 - \text{Log}_N(2^3) =$

$= 0 - 3\text{Log}_N 2 = 0$

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. **Express each of the following using an algebraic expression in terms of a, b, and/or c.**

11. $\text{Log}_N (3N^3) =$ <u>b + 3</u>

$= \text{Log}_N 3 + \text{Log}_N (N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ ___________

$= \text{Log}_N (1/8) = \text{Log}_N (1/2^3) =$

$= \text{Log}_N 1 - \text{Log}_N (2^3) =$

$= 0 - 3\text{Log}_N 2 = 0 -$

13. $\text{Log}_N 0.6 =$ ___________

14. $\text{Log}_N \sqrt{6} =$ ___________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\text{Log}_N(3N^3) =$ b + 3

$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ __________

$= \text{Log}_N(1/8) = \text{Log}_N(1/2^3) =$

$= \text{Log}_N 1 - \text{Log}_N(2^3) =$

$= 0 - 3\text{Log}_N 2 = 0 - 3a$

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. **Express each of the following using an algebraic expression in terms of a, b, and/or c.**

11. $\text{Log}_N(3N^3) =$ ___b + 3___

$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ __________

$= \text{Log}_N(1/8) = \text{Log}_N(1/2^3) =$

$= \text{Log}_N 1 - \text{Log}_N(2^3) =$

$= 0 - 3\text{Log}_N 2 = 0 - 3a =$

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N\sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\log_N(3N^3) =$ **b + 3**

$= \log_N 3 + \log_N(N^3) =$

$= \log_N 3 + 3\log_N N =$

$= \log_N 3 + 3(1) =$

12. $\log_N 0.125 =$ **-3a**

$= \log_N(1/8) = \log_N(1/2^3) =$

$= \log_N 1 - \log_N(2^3) =$

$= 0 - 3\log_N 2 = 0 - 3a =$

13. $\log_N 0.6 =$ __________

14. $\log_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\log_N 2 = a$; $\log_N 3 = b$; $\log_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\log_N(3N^3) =$ ___b + 3___

$= \log_N 3 + \log_N(N^3) =$

$= \log_N 3 + 3\log_N N =$

$= \log_N 3 + 3(1) =$

12. $\log_N 0.125 =$ ___-3a___

$= \log_N(1/8) = \log_N(1/2^3) =$

$= \log_N 1 - \log_N(2^3) =$

$= 0 - 3\log_N 2 = 0 - 3a =$

13. $\log_N 0.6 =$ __________

14. $\log_N\sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\text{Log}_N (3N^3) =$ ___b + 3___

$= \text{Log}_N 3 + \text{Log}_N (N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ ___-3a___

$= \text{Log}_N (1/8) = \text{Log}_N (1/2^3) =$

$= \text{Log}_N 1 - \text{Log}_N (2^3) =$

$= 0 - 3\text{Log}_N 2 = 0 - 3a =$

13. $\text{Log}_N 0.6 =$ __________

14. $\text{Log}_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

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11. $\text{Log}_N(3N^3) =$ **b + 3**

$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ **-3a**

$= \text{Log}_N(1/8) = \text{Log}_N(1/2^3) =$

$= \text{Log}_N 1 - \text{Log}_N(2^3) =$

$= 0 - 3\text{Log}_N 2 = 0 - 3a =$

13. $\text{Log}_N 0.6 =$ ____________

$=$

14. $\text{Log}_N \sqrt{6} =$ ___________

Algebra II Class Worksheet #2 Unit 11

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11. $\log_N(3N^3) =$ <u>b + 3</u>

$= \log_N 3 + \log_N(N^3) =$

$= \log_N 3 + 3\log_N N =$

$= \log_N 3 + 3(1) =$

12. $\log_N 0.125 =$ <u>-3a</u>

$= \log_N(1/8) = \log_N(1/2^3) =$

$= \log_N 1 - \log_N(2^3) =$

$= 0 - 3\log_N 2 = 0 - 3a =$

13. $\log_N 0.6 =$ __________

$= \log_N(3/5)$

14. $\log_N \sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\mathrm{Log}_N 2 = a$; $\mathrm{Log}_N 3 = b$; $\mathrm{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

11. $\mathrm{Log}_N(3N^3) =$ __b + 3__

$= \mathrm{Log}_N 3 + \mathrm{Log}_N(N^3) =$

$= \mathrm{Log}_N 3 + 3\,\mathrm{Log}_N N =$

$= \mathrm{Log}_N 3 + 3(1) =$

12. $\mathrm{Log}_N 0.125 =$ __-3a__

$= \mathrm{Log}_N(1/8) = \mathrm{Log}_N(1/2^3) =$

$= \mathrm{Log}_N 1 - \mathrm{Log}_N(2^3) =$

$= 0 - 3\mathrm{Log}_N 2 = 0 - 3a =$

13. $\mathrm{Log}_N 0.6 =$ ___________

$= \mathrm{Log}_N (3/5) =$

$=$

14. $\mathrm{Log}_N\sqrt{6} =$ __________

Algebra II Class Worksheet #2 Unit 11

Given: $\text{Log}_N 2 = a$; $\text{Log}_N 3 = b$; $\text{Log}_N 5 = c$. Express each of the following using an algebraic expression in terms of a, b, and/or c.

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$= \text{Log}_N 3 + \text{Log}_N(N^3) =$

$= \text{Log}_N 3 + 3\,\text{Log}_N N =$

$= \text{Log}_N 3 + 3(1) =$

12. $\text{Log}_N 0.125 =$ **-3a**

$= \text{Log}_N(1/8) = \text{Log}_N(1/2^3) =$

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Algebra II Class Worksheet #2 Unit 11

Evaluate each of the following.

15. $\text{Log}_2 32 =$ _____

16. $\text{Log}_3 (1/9) =$ _____

17. $\text{Log}_9 3 =$ _____

18. $\text{Log}_8 0.125 =$ _____

19. $\text{Log}_2 (1/16) =$ _____

20. $\text{Log}_5 \sqrt{5} =$ _____

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Evaluate each of the following. Express irrational answers rounded to the nearest tenth.

21. Log 1000 = _____

22. Log 0.001 = _____

23. Log 60 = _____

24. Log 0.3 = _____

25. $\ln e^{3}$ = _____

26. $\ln e^{-3}$ = _____

27. ln 60 = _____

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21. $\text{Log } 1000 = \underline{\ 3\ }$

$1000 = 10^3$

22. $\text{Log } 0.001 = \underline{\ -3\ }$

$0.001 = 10^{-3}$

23. $\text{Log } 60 \approx \underline{\ 1.8\ }$

$60 \approx 10^{1.8}$

24. $\text{Log } 0.3 \approx \underline{\ -0.5\ }$

$0.3 \approx 10^{-0.5}$

25. $\ln e^3 = \underline{\ 3\ }$

26. $\ln e^{-3} = \underline{\ -3\ }$

27. $\ln 60 \approx \underline{\ 4.1\ }$

$60 \approx e^{4.1}$

28. $\ln 0.3 \approx \underline{\ -1.2\ }$

$0.3 \approx$

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