



Properties of Logarithms

Name: _____

Date: _____



Expand each logarithm.

1) $\log_8(x \cdot y \cdot z^3) =$

2) $\log_7\left(\frac{x^2}{y}\right)^3 =$

3) $\log_4(6^3 \cdot 11^4) =$

4) $\log_2(2^{11} \cdot 11 \cdot 7^4) =$

5) $\log_2(u \cdot v \cdot w^2) =$

6) $\log_9(12^3 \cdot 7)^8 =$

7) $\log_5 \frac{x^6}{y^5} =$

8) $\log_5 \frac{3^5}{7^8} =$

9) $\log_5(x \cdot y)^6 =$

10) $\log(3 \cdot 2^3) =$

11) $\log(5 \cdot 3) =$

12) $\log(6 \cdot 11) =$

13) $\log\left(\frac{9}{4}\right)^5 =$

14) $\log(7^2 \cdot 8)^6 =$



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Answers



Expand each logarithm.

$$1) \log_8(x \cdot y \cdot z^3) = \\ \log_8 x + \log_8 y + 3 \log_8 z$$

$$2) \log_7 \left(\frac{x^2}{y} \right)^3 = \\ 6 \log_7 x - 3 \log_7 y$$

$$3) \log_4(6^3 \cdot 11^4) = \\ 3 \log_4 6 + 4 \log_4 11$$

$$4) \log_2(2^{11} \cdot 11 \cdot 7^4) = \\ 11 \log_2 2 + \log_2 11 + 4 \log_2 7$$

$$5) \log_2(u \cdot v \cdot w^2) = \\ \log_2 u + \log_2 v + 2 \log_2 w$$

$$6) \log_9(12^3 \cdot 7)^8 = \\ 24 \log_9 12 + 8 \log_9 7$$

$$7) \log_5 \frac{x^6}{y^5} = \\ 6 \log_5 x - 5 \log_5 y$$

$$8) \log_5 \frac{3^5}{7^8} = \\ 5 \log_5 3 - 8 \log_5 7$$

$$9) \log_5(x \cdot y)^6 = \\ 6 \log_5 x + 6 \log_5 y$$

$$10) \log(3 \cdot 2^3) = \\ \log 3 + 3 \log 2$$

$$11) \log(5 \cdot 3) = \\ \log 5 + \log 3$$

$$12) \log(6 \cdot 11) = \\ \log 6 + \log 11$$

$$13) \log \left(\frac{9}{4} \right)^5 = \\ 5 \log 9 - 5 \log 4$$

$$14) \log(7^2 \cdot 8)^6 = \\ 12 \log 7 + 6 \log 8$$



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