

Properties of Logs Quiz REVIEW

Expand each logarithm.

1) $\log_7 x^6$

$$6 \log_7 x$$

3) $\log_3 \sqrt[3]{u}$

$$\log_3 u^{1/3} = \frac{1}{3} \log_3 u$$

5) $\log_9 \sqrt[3]{u}$

2) $\log \frac{x}{y}$

$$\log x - \log y$$

4) $\log_4 \frac{x}{y}$

6) $\log_9 (x \cdot y)$

Condense each expression to a single logarithm.

7) $4 \log x$

$$\log x^4$$

9) $5 \log a$

8) $\log x - \log y$

10) $\frac{1}{3} \log a$

$$= \log a^{1/3} = \log \sqrt[3]{a}$$

Expand each logarithm.

11) $\log_9 (xy^3)^4$

$$\log_9 (x^4 y^{12}) = \log_9 x^4 + \log_9 y^{12} = 4 \log_9 x + 12 \log_9 y$$

13) $\log_5 \left(\frac{u^6}{v}\right)^4$

12) $\log_2 (z^6 \sqrt{x})$

14) $\log_3 (z^3 \sqrt{x \cdot y}) = \log_3 (z^3 \cdot x^{1/2} \cdot y^{1/2})$

$$= \log_3 z^3 + \log_3 x^{1/2} + \log_3 y^{1/2}$$

16) $\log_5 (u^4 v^6)$

$$= \log_5 u^4 + \log_5 v^6 = 4 \log_5 u + 6 \log_5 v$$

15) $\log_4 \sqrt{x \cdot y \cdot z}$

Condense each expression to a single logarithm.

17) $6 \log_6 a + 5 \log_6 b$

$$\log_6 a^6 + \log_6 b^5 = \log_6 (a^6 b^5)$$

19) $3 \log_2 a - 3 \log_2 b$

18) $5 \log_3 x - 15 \log_3 y$

20) $15 \log_9 u - 5 \log_9 v$