

Condensing Logs Homework

Condense each expression to a single logarithm.

13) $\log 3 - \log 8$

$$\log\left(\frac{3}{8}\right)$$

14) $\frac{\log 6}{3}$

$$\frac{\log 6}{3}$$

OR $\frac{1}{3}\log 6$
 $\log 6^{\frac{1}{3}}$

$$\log \sqrt[3]{6}$$

15) $4\log 3 - 4\log 8$

$$\log 3^4 - \log 8^4$$

$$\log\left(\frac{3^4}{8^4}\right)$$

$$\log\left(\frac{81}{4096}\right)$$

16) $\log 2 + \log 11 + \log 7$

$$\log(2 \cdot 11 \cdot 7)$$

$$\log(154)$$

17) $\log 7 - 2\log 12$

$$\log\left(\frac{7}{12^2}\right)$$

$$\log\left(\frac{7}{144}\right)$$

18) $\frac{2\log 7}{3}$

$$\frac{\log 7^2}{3}$$

$$\frac{\log 49}{3}$$

OR $\frac{1}{3}\log 49$

$$\log 49^{\frac{1}{3}}$$

$$\log \sqrt[3]{49}$$

19) $6\log_3 u + 6\log_3 v$

$$\log_3 u^6 + \log_3 v^6$$

$$\log_3(u^6 v^6)$$

21) $\log_4 u - 6\log_4 v$

$$\log_4 u - \log_4 v^6$$

$$\log_4\left(\frac{u}{v^6}\right)$$

20) $\ln x - 4\ln y$

$$\ln\left(\frac{x}{y^4}\right)$$

$$\log \sqrt[3]{49}$$

22) $\log_3 u - 5\log_3 v$

$$\log_3\left(\frac{u}{v^5}\right)$$

23) $20\log_6 u + 5\log_6 v$

$$\log_6 u^{20} + \log_6 v^5$$

$$\log_6 u^{20} v^5$$

24) $4\log_3 u - 20\log_3 v$

$$\log_3 u^4 - \log_3 v^{20}$$

$$\log_3\left(\frac{u^4}{v^{20}}\right)$$

Critical thinking questions:

25) $2(\log 2x - \log y) - (\log 3 + 2\log 5)$

$$2\log 2x - 2\log y - (\log 3 + \log 5^2)$$

$$\log(2x)^2 - \log y^2 - \log 75$$

$$\log 4x^2 - \log y^2 - \log 75$$

$$\log\left(\frac{4x^2}{75y^2}\right)$$

26) $\log x \cdot \log 2$

Can't
condense