

Expanding and Condensing Logarithms

A) Expand each expression.

$$1) \log_5 \sqrt[3]{8m^7} = \underline{\hspace{15em}}$$

$$2) \log_9 \left(\frac{4}{u} \right)^8 = \underline{\hspace{15em}}$$

$$3) \log_3 \left(\frac{x^4 y^6}{z} \right) = \underline{\hspace{15em}}$$

$$4) 5 \log_2 \left(\frac{p^3}{r^8} \right) = \underline{\hspace{15em}}$$

$$5) \log_e \left(\frac{r s^3}{t^4 v^7} \right) = \underline{\hspace{15em}}$$

B) Rewrite each expression as a single logarithm.

$$1) 5 \log_6 m - 4 \log_6 n = \underline{\hspace{15em}}$$

$$2) \frac{1}{4} (8 \log_8 6 + \log_8 h) = \underline{\hspace{15em}}$$

$$3) 49 \log_e r - (21 \log_e s + 63 \log_e t) = \underline{\hspace{15em}}$$

$$4) 5 (\log_7 7 - \log_7 4) = \underline{\hspace{15em}}$$

$$5) (14 \log_4 u + 12 \log_4 v) - 2 \log_4 b = \underline{\hspace{15em}}$$