Exercise 270

For the following exercises, use properties of logarithms to write the expressions as a sum, difference, and/or product of logarithms.

$$\log x^4 y$$

Solution

There are three properties of logarithms to know.

$$\log(ab) = \log a + \log b \tag{1}$$

$$\log\left(\frac{a}{b}\right) = \log a - \log b \tag{2}$$

$$\log a^b = b \log a \tag{3}$$

Apply property (1) and then apply property (3).

$$\log x^4 y = \log x^4 + \log y$$

$$= 4 \log x + \log y$$