4.3 - Properties of Logarithms

Skills:

- Use properties of logarithms to expand and collapse expressions

Product Law

$$\log_n(xy) = \log_n(x) + \log_n(y)$$

Quotient Law

$$\log_n\left(\frac{x}{y}\right)=\log_n(x)-\log_n(y)$$

Exponent Law

$$\log_n\left(x^y\right) = y \cdot \log_n\left(x\right)$$

Example

$$\log_3\left(\frac{5x}{y^7}\right)$$

Example

$$\ln\left(\frac{x^3}{y^2\sqrt[3]{z}}\right)$$

Example

$$\log_3(12) + \log_3(48)$$

Example

$$\log\left(x^2-4\right)+\log\left(x-2\right)-\log\left(x^4-8x^2+16\right)$$

Change of Base

$$\log_a(x) = \frac{\log_n(x)}{\log_n(a)}$$