We can expand a log, as well.

Ev) Given $a = \log_5 x$, $b = \log_5 y$
and $c = \log_5 z$
write $\log_5 \left(\dfrac{\sqrt{x}}{y^2 z^2} \right)$ in terms
of a, b, c.

$$\log_5 (\sqrt{x}) - \log_5 (y^2 z^2)$$

$$\log_5 (\sqrt{x}) - \left(\log_5 y^2 + \log_5 z^2 \right)$$

$$\log_5 x^{1/2} - \log_5 y^2 - \log_5 z^2$$

$$\tfrac{1}{2} \log_5 x - 2 \log_5 y - 2 \log_5 z$$

$$\tfrac{1}{2} a - 2 b - 2 c$$

Change of Base

- $\log_a b = \dfrac{\log_c b}{\log_c a}$

Ex) Evaluate $\log_4 9$ to 3 sf

use either $\log_{10}$ or $\ln$

$$\log_4 9 = \frac{\ln 9}{\ln 4} \approx 1.58$$

Ex) $\log_x 3 = a$, $\log_x 6 = b$

find $\log_3 6$ in terms of a & b

$$\log_3 6 = \frac{\log_x 6}{\log_x 3} = \frac{b}{a}$$

Hw 40 p.126 1, 2, 3, 5b