Properties of logarithms — Graphic organizer

Name	Rule(s)	Example 1	Example 2
Basic logarithms	$\log_b b = 1$ $\log_b 1 = 0$	$\log_{14} 14 = 1$	$\log_3 1 = 0$
Product Rule	$\log_b (m \cdot n) =$ $\log_b M + \log_b n$	$\log_3 6 + \log_3 7 =$ $\log_3 (6 \times 7) = \log_3 42$	$\log_2 63 = \log_2 9 + \log_2 7$
Quotient rule	$\log_b (m/n) =$ $\log_b m - \log_b n$	$\log_4 84 - \log_4 12 =$ $\log_4 \left(\frac{84}{12}\right) = \log_4 7$	$\log 9 = \log_{10} 9$
Power rule log	$\log_b m^n = n \log_b m$	$2\log_3 8 = \log_3 8^2$ $= \log_3 64$	$\log_2 6^{(x-1)} = (x-1)\log_2 6$
Change of base formula	$\log_b a = \frac{\log_c a}{\log_c b}$	$\log_7 32 = \frac{\log_6 32}{\log_6 7}$ $= \frac{1.9342}{1.0860}$ $= 1.781$	