

10-3: properties of Logs

Remember: Logs are really just exponents. So, the same properties apply.

Product property: $\log_b mn = \log_b m + \log_b n$

Quotient property: $\log_b \frac{m}{n} = \log_b m - \log_b n$

Power property: $\log_b m^p = p \cdot \log_b m$

* the exponential power on the log number may be "pulled out" in front.

#41
revisited

$$\log_2(4x+10) - \log_2(x+1) < 3$$

$$\log_2\left(\frac{4x+10}{x+1}\right) < 3$$

$$\cancel{(x+1)} \frac{4x+10}{\cancel{x+1}} < 8(x+1)$$

$$\log_2 8$$

$2^3 =$

$$\begin{array}{r} 4x + 10 < 8x + 8 \\ -4x - 8 \quad -4x - 8 \end{array}$$

$$\frac{2}{4} < \frac{4x}{4}$$

$$x > \frac{1}{2}$$

p. 614 # 5-16 together

$$(5) \log_4 x^2 y = \log_4 x^2 + \log_4 y$$

$$2 \cdot \log_4 x + \log_4 y$$

$$(6) \log_3 (x^3 y^3) = 3 \log_3 x + 3 \log_3 y$$

$$(7) \log_5 \frac{ac}{b} = \log_5 ac - \log_5 b$$

$$\log_5 a + \log_5 c - \log_5 b$$

$$(9) \log_2 \frac{7}{3} = \log_2 7 - \log_2 3$$

$$2.807 - 1.585 = 1.222$$

$$\textcircled{10.} \log_2 36 \rightarrow \begin{array}{c} 36 \\ \wedge \\ 6 \quad 6 \\ \wedge \quad \wedge \\ 3 \cdot 2 \quad 3 \cdot 2 \\ 3^2 \cdot 2^2 = 36 \end{array}$$

$$\log_2 (3^2 \cdot 2^2)$$

$$2 \log_2 3 + 2 \log_2 2$$

$$2(1.585) + 2(1) = 3.17 + 2 = \textcircled{5.17}$$

$$\textcircled{11.} \log_2 (0.75) \rightarrow \log_2 \left(\frac{3}{4} \right)$$

$$\log_2 3 - \log_2 4$$

$$1.585 - 2$$

$$= -.415$$

p. 615 # 17-25