

12.4
p. 832-833

Rules

- ① $\log_b xy = \log_b x + \log_b y$
- ② $\log_b \frac{x}{y} = \log_b x - \log_b y$
- ③ $\log_b x^r = r \cdot \log_b x$

May 4-6:31 PM

p. 837

ex 14 $\log_8 (9 \cdot 11) = \log_8 9 + \log_8 11$

ex 16 $\log_3 \frac{7}{5} = \log_3 7 - \log_3 5$ ←
 $\log_3 (7 \cdot 5^{-1}) = \log_3 7 + \log_3 5^{-1}$
 $= \log_3 7 - \log_3 5$ ←

ex 18 $\log_5 7^4 = 4 \cdot \log_5 7$

ex 20 $\log_7 \frac{\sqrt[3]{13}}{pq^2} = \log_7 \frac{13^{1/3}}{pq^2}$
 $= \log_7 13^{1/3} - \log_7 (pq^2)$
 $= \frac{1}{3} \log_7 13 - (\log_7 p + \log_7 q^2)$
 $= \frac{1}{3} \log_7 13 - (\log_7 p + 2 \log_7 q)$
 $= \frac{1}{3} \log_7 13 - \log_7 p - 2 \log_7 q$

May 4-6:41 PM

ex 22

$$\begin{aligned} \log_6 \sqrt{\frac{pq}{7}} &= \log_6 \left(\frac{pq}{7} \right)^{\frac{1}{2}} = \frac{1}{2} \log_6 \left(\frac{pq}{7} \right) \\ &= \frac{1}{2} \left(\log_6 p + \log_6 q - \log_6 7 \right) \\ &= \frac{1}{2} \log_6 p + \frac{1}{2} \log_6 q - \frac{1}{2} \log_6 7 \end{aligned}$$

May 4-6:55 PM

ex 26 $\log_b w + \log_b z = \log_b(wz)$

~~$(\log_b w) \cdot z$~~

ex 28 $\log_b x - \log_b y = \log_b \left(\frac{x}{y} \right)$

‡ $-\log_b x + \log_b y = \log_b \frac{y}{x}$

‡ $-\log_b x - \log_b y = \log_b \frac{1}{xy}$

May 4-7:01 PM

$$\begin{aligned} \text{ex 30} \quad & (\log_a p - \log_a q) + 2 \log_a r \\ &= \log_a \frac{p}{q} + \log_a \frac{r^2}{1} \\ &= \log_a \frac{pr^2}{q} \end{aligned}$$

May 4-7:05 PM

ex 32

$$\begin{aligned} 3 \log_a 5 - \frac{1}{2} \log_a 9 &= \\ \log_a 5^3 - \log_a 9^{\frac{1}{2}} &= \\ \log_a 125 - \log_a 3 &= \log_a \frac{125}{3} \end{aligned}$$

$9^{\frac{1}{2}} = \sqrt{9} = 3$

May 4-7:08 PM

ex 34

$$\begin{aligned} & \log_{10}(x+4) + \log_{10}(x+6) \\ &= \log_{10}[(x+4)(x+6)] \\ &= \log_{10}(x^2 + 10x + 24) \end{aligned}$$

May 4-7:11 PM

ex 36

$$\begin{aligned} & \frac{1}{3} \log_b x + \frac{2}{3} \log_b y - \frac{3}{4} \log_b s - \frac{2}{3} \log_b t \\ & \log_b x^{\frac{1}{3}} + \log_b y^{\frac{2}{3}} - \log_b s^{\frac{3}{4}} - \log_b t^{\frac{2}{3}} \\ &= \log_b \frac{x^{\frac{1}{3}} y^{\frac{2}{3}}}{s^{\frac{3}{4}} t^{\frac{2}{3}}} \end{aligned}$$

May 4-7:13 PM