

$$p382 \quad 16. \quad \log_4 \frac{x}{32}$$

$$\log_4 x - \log_4 32$$

$$\log_4 x - (\log_4 16 \cdot 2)$$

$$\log_4 x - (\log_4 16 + \log_4 2)$$

$$\log_4 x - \left(2 + \frac{1}{2}\right)$$

$4^2 = 16$
 $\log_4 16 = 2$
 $4^{\frac{1}{2}} = 2$

$$\log_4 x - 2\frac{1}{2}$$

$$\log_4 x - \frac{5}{2}$$

$\log_4 2 = \frac{1}{2}$
 $\sqrt{4} = 2$

$$\log_2 8xy$$

$$\log_2 8 + \log_2 x + \log_2 y$$

$$3 + \log_2 x + \log_2 y$$

$$\log_2 8 = x$$

$$2^x = 8$$

$$2^3 = 8$$

$$\boxed{x = 3}$$

$$22. \log_2 105$$

$$\log_2 (7 \cdot 5 \cdot 3)$$

$$\log_2 7 + \log_2 5 + \log_2 3$$

$$2.8074 + 2.3219 + 1.5850$$

$$\log_2 105 \approx 6.7143$$

$$\log_{10} .0083$$

$$\log_{10} 8.3$$

$$\approx .9191$$

$$8.3(001) \quad \frac{8.3}{1000}$$

$$\log_{10} \frac{8.3}{1000} = \log_{10} 8.3 - \log_{10} 1000$$

$$.9191 - 3$$

$$\log_{10} .0083 \approx -2.0809$$

$$26. \log_2 \frac{7}{10}$$

$$\log_2 7 - \log_2 10$$

$$\log_2 7 - (\log_2 5 \cdot 2)$$

$$\log_2 7 - (\log_2 5 + \log_2 2)$$

$$2.8074 - (2.3219 + 1)$$

$$2.8074 - 3.3219$$

$$-.5145$$

$$2^{-.5145} \approx \frac{7}{10}$$

$$2 \wedge -.5145$$

$$28. \log_2 \frac{2}{7}$$

$$\log_2 2 - \log_2 7$$

$$1 - 2.8074$$

$$-1.8074$$

$$30. \log_4 8 + \log_4 2$$

$$\log_4 (8 \cdot 2)$$

$$\log_4 16$$

$$\textcircled{2}$$

$$34. \log_3 x + \log_3 4 - \log_3 2$$

$$\log_3 \frac{4x}{2}$$

$$\log_3 2x \quad \text{Simplify}$$

$$36. \log_5 6s - \log_5 s + \log_5 4t$$

$$\log_5 \frac{6s(4t)}{s}$$

$$\log_5 24t$$

$$32. \log_2 14 - \log_2 7$$

$$\log_2 \frac{14}{7}$$

$$\log_2 2$$

$$1$$

$$18. 5.1293$$

$$20. 1.7925$$

6.4

$$\log_b m^p$$

Power Property
of logarithms

$$p \log_b m$$

$$\log_2 4^3$$

$$3 \log_2 4$$

$$3(2)$$

6

$$\log_2 4^3 = x$$

$$2^x = 4^3$$

$$2^x = 64$$

$$2^6 = 64$$

$$x = 6$$



$$37. \quad \overset{5}{\log_2 m} - \overset{2}{\log_2 n}$$

$$\log_2 m^5 - \log_2 n^2$$

$$\log_2 \frac{m^5}{n^2}$$

$$39. \quad 4 \log_b m + \frac{1}{2} \log_b n - 3 \log_b p$$

$$\log_b m^4 + \log_b n^{\frac{1}{2}} - \log_b (2p)^3$$

$$\log_b m^4 + \log_b n^{\frac{1}{2}} - \log_b 8p^3$$

$$\log_b \frac{m^4 n^{\frac{1}{2}}}{8p^3}$$

$$41. \quad 1 - 2 \log_7 x$$

$$1 - \log_7 x^2$$

$$\log_7 7 - \log_7 x^2$$

$$\log_7 \frac{7}{x^2}$$

$$1 - \log_5 25$$

$$1 - 2$$

$$-1$$

p 382
38-42 E

$$\log_b mn = \log_b m + \log_b n$$

$$\log_b \frac{m}{n} = \log_b m - \log_b n$$