

Algebra 2 6.5 Properties of Logarithms

Pg. 331 (3-6, 13-19, 23-29, 33-37)

Use $\log_7 4 = .712$ & $\log_7 12 = 1.277$

$$\textcircled{3} \log_7 3 \rightarrow \log_7 \left(\frac{12}{4}\right) \rightarrow \log_7 12 - \log_7 4$$

$$1.277 - .712 \Rightarrow \boxed{.565}$$

$$\textcircled{4} \log_7 48 \rightarrow \log_7 (12 \cdot 4) \rightarrow \log_7 12 + \log_7 4$$

$$1.277 + .712 \Rightarrow \boxed{1.989}$$

$$\textcircled{5} \log_7 16 \rightarrow \log_7 (4^2) \rightarrow 2 \log_7 4 \rightarrow 2 [.712] \Rightarrow \boxed{1.424}$$

$$\textcircled{6} \log_7 64 \rightarrow \log_7 (4^3) \rightarrow 3 \cdot \log_7 (4) \rightarrow 3 [.712] \rightarrow \boxed{2.136}$$

$$\textcircled{13} \log_3 4x \rightarrow \boxed{\log_3 4 + \log_3 x}$$

$$\textcircled{14} \log_8 (3x) \rightarrow \boxed{\log_8 3 + \log_8 x}$$

$$\textcircled{15} \log 10x^5$$

$$\log 10 + \log x^5$$

$$\boxed{\log 10 + 5 \log x}$$

$$\textcircled{16} \ln 3x^4$$

$$\ln 3 + \ln x^4$$

$$\boxed{\ln 3 + 4 \ln x}$$

$$\textcircled{17} \ln \left[\frac{x}{3y}\right]$$

$$\ln x - \ln 3y$$

$$\boxed{\ln x - [\ln 3 + \ln y]}$$

$$(18) \ln\left(\frac{6x^2}{y^4}\right) \rightarrow \ln(6x^2) - \ln(y^4)$$

$$\ln 6 + \ln x^2 - 4 \ln y \rightarrow \boxed{\ln 6 + 2 \ln x - 4 \ln y}$$

$$(19) \log_7 5\sqrt{x} \rightarrow \log_7 5 + \log_7 \sqrt{x} \rightarrow \log_7 5 + \log_7 x^{1/2}$$

$$\boxed{\log_7 5 + \frac{1}{2} \log_7 x}$$

$$(23) \log_4 7 - \log_4 10$$

$$\boxed{\log_4 \frac{7}{10}}$$

$$(24) \ln(12) - \ln(4)$$

$$\ln\left(\frac{12}{4}\right) \rightarrow \boxed{\ln 3}$$

$$(25) 6 \ln x + 4 \ln y$$

$$\ln x^6 + \ln y^4$$

$$\boxed{\ln(x^6 y^4)}$$

$$(26) 2 \log x + \log 11$$

$$\log x^2 + \log 11$$

$$\boxed{\log(11x^2)}$$

$$(27) \log_5 4 + \frac{1}{3} \log_5 x$$

$$\log_5 4 + \log_5 x^{1/3}$$

$$\boxed{\log_5 4\sqrt[3]{x}}$$

$$(28) 6 \ln 2 - 4 \ln y$$

$$\ln 2^6 - \ln y^4$$

$$\boxed{\ln\left(\frac{64}{y^4}\right)}$$

$$\textcircled{33} \quad \log_4 7 \rightarrow \frac{\log 7}{\log 4} = \boxed{1.464}$$

$$\textcircled{34} \quad \log_5 13 \rightarrow \frac{\ln(13)}{\ln(5)} \rightarrow \boxed{1.59}$$

$$\textcircled{35} \quad \log_9 15 \rightarrow \frac{\log 15}{\log 9} = \boxed{1.23}$$

$$\textcircled{36} \quad \log_8 22 \rightarrow \frac{\ln 22}{\ln 8} \rightarrow \boxed{1.486}$$

$$\textcircled{37} \quad \log_6 17 = \frac{\ln 17}{\ln 6} \rightarrow \boxed{1.58}$$