

$$2. \ln 9y = \ln 9 + \ln y$$

$$4. \log \frac{2}{y} = \log 2 - \log y$$

$$6. \log_2 x^{-2} = -2 \log_2 x$$

$$8. \log xy^3 = \log x + 3 \log y$$

$$10. \log 1000x^4 = \log 1000 + 4 \log x \\ = \boxed{\log 3 + 4 \log x}$$

$$12. \ln \frac{\sqrt[3]{x}}{\sqrt[3]{y}} = \frac{1}{3} \ln x - \frac{1}{3} \ln y$$

$$14. \log x + \log 5 = \boxed{\log 5x}$$

$$16. \ln x - \ln y = \boxed{\ln \frac{x}{y}}$$

$$18. \frac{1}{5} \log z = \log z^{\frac{1}{5}} \\ = \boxed{\log \sqrt[5]{z}}$$

$$20. 4 \log y - \log z \\ = \log y^4 - \log z \\ = \boxed{\log \frac{y^4}{z}}$$

$$22. 3 \ln(x^3y) + 2 \ln(yz^2) \\ \ln(x^3y)^3 + \ln(yz^2)^2 \\ \ln x^9 y^3 + \ln y^2 z^4 \\ \ln(x^9 y^3 \cdot y^2 z^4) = \boxed{\ln x^9 y^5 z^4}$$

$$24. \log_5 19 = \frac{\log 19}{\log 5} \approx 1.83$$

$$26. \log_{12} 259 = \frac{\log 259}{\log 12} = 2.24$$

$$28. \log_{.2} 29 = \frac{\log 29}{\log .2} \approx -2.09$$

$$30. \log_7 x = \frac{\ln x}{\ln 7}$$

$$32. \log_5 (c-d) = \frac{\ln (c-d)}{\ln 5}$$

$$34. \log_4 x = \frac{\log x}{\log 4}$$

$$36. \log_3 (x-y)$$

$$= \frac{\log(x-y)}{\log \frac{1}{3}} = \frac{\log(x-y)}{\log 1 - \log 3}$$

$\downarrow$   
 $= 0$

$\frac{\log(x-y)}{-\log 3}$