

156 a. $\ln(36) = \ln(6^2) = 2 \times \ln(6) = 2 \times \ln(2 \times 3) = 2 \times (\ln(2) + \ln(3)) = 2 \ln(2) + 2 \ln(3).$

b. $\ln\left(\frac{8}{9}\right) = \ln(8) - \ln(9) = \ln(2^3) - \ln(3^2) = 3\ln(2) - 2 \ln(3).$

c. $\ln\left(\frac{2^5 \times 3^6}{3^{-2}}\right) = \ln\left(2^5 \times \frac{3^6}{3^{-2}}\right) = \ln(2^5) + \ln\left(\frac{3^6}{3^{-2}}\right) = 5 \ln(2) + \ln(3^8) = 5 \ln(2) + 8 \ln(3).$