Math 121 – Section 5.5 Solutions

7. $\log_3 3^{71} = 71 \log_3 3 = \boxed{71}$

16. $\log_8 16 - \log_8 2 = \log_8 \dfrac{16}{2} = \log_8 8 = \boxed{1}$

31. $\log_5(25x) = \log_5 25 + \log_5 x = \log_5 5^2 + \log_5 x = \boxed{2 + \log_5 x}$

38. $\ln \dfrac{x}{e^x} = \ln x - \ln e^x = \boxed{\ln x - x}$

51. $3 \log_5 u + 4 \log_5 v = \log_5 u^3 + \log_5 v^4 = \boxed{\log_5(u^3 v^4)}$

55. $\log_4(x^2 - 1) - 5 \log_4(x + 1) = \log_4(x^2 - 1) - \log_4(x + 1)^5 = \log_4 \left[\dfrac{x^2 - 1}{(x + 1)^5} \right] = \boxed{\log_4 \left[\dfrac{x - 1}{(x + 1)^4} \right]}$

63. $2 \log_2(x + 1) - \log_2(x + 3) - \log_2(x - 1) = \log_2(x + 1)^2 - \log_2(x + 3) - \log_2(x - 1) = \boxed{\log_2 \left[\dfrac{(x + 1)^2}{(x + 3)(x - 1)} \right]}$