Day #57 Homework

Rewrite each of the following expressions as a single logarithm of the same base.

1. $5\log x + 2\log x$	2. $\log_3 125 - \log_3 5$	3. $2\ln x + 3\ln y - 5\ln z$
4. $\log_4 60 - \log_4 4 + \log_4 x$	5. $\frac{1}{2}\ln x + 2\ln x$	6. $\ln 4x + 2\ln 2x$

Expand each of the following expressions as the sum and/or difference of multiple logarithms.

7. $\log(xyz)$	8. $\ln\left(\frac{2x}{y}\right)$
9. $\ln\left(6x^2 y\right)$	10. $\log_2\left(\frac{7}{xy^2}\right)$

11. $\log_5 \sqrt{x^3 y}$	12. $\ln\left(\dfrac{3x}{y^2}\right)$

Solve each of the following equations for x by rewriting each side of the equation as a single logarithm of the same base. Then, set the arguments equal to one another. If the equation has no solution, then specifically explain why.

13. $\log_3(x+2) - \log_3 2 = \log_3(2x-5)$	14. $\ln(2x+5) - \ln 5 = \ln(x-2)$
15. $2\ln 3 + \ln(x-4) = \ln 3x$	16. $\log(x-3) + \log(x) = \log 12 - \log 3$