Classwork Properties of Logarithms

Please work all problems on a separate sheet of paper.

Use properties of logarithms to express each of the following as sums or differences of simpler logarithms.

1. $\log_a \dfrac{(xy)^3}{\sqrt{z}}$

2. $\log_a \dfrac{w^2 z^4}{3x^6}$

3. $\log_a \dfrac{\left(x^2+4\right)^2}{\sqrt{x+1}}$

Use properties of logarithms to express each of the following as a single logarithm.

4. $2\log_a x + \dfrac{1}{2}\log_a (x+1)$

5. $\dfrac{1}{3}\log_a x + 4\log_a y - \log_a z$

6. $\log_a x - \log_a (x+1) - \log_a (x-1)$

7. $4\ln x + 2\ln y$

8. $\log_2 x - \log_2 y - \log_2 z$

9. $\dfrac{1}{2}\log_3 x - 2\log_3 y - \log_3 z$