Example 7: Rewrite the expression in a form with no logarithm of a product, power, or quotient.

$\log_7\left(\frac{\sqrt{x+1}}{x^3}\right)$ $= \log_7(\sqrt{x+1}) - \log_7(x^3)$

$= \log_7((x+1)^{1/2}) - \log(x^3)$

$= \frac{1}{2}\log_7(x+1) - 3\log_7 x$

Example 8: Rewrite the following so that each logarithm contains a prime number.

$\log_2 35 = \log_2(5\cdot 7) = \log_2 5 + \log_2 7$

$\log_3 100 = \log_3(2^2 \times 5^2) = \log_3(2^2) + \log_3(5^2)$

$= 2\log_3 2 + 2\log_3 5$

$100 = 10 \times 10$

$\Rightarrow 2\times 5 \times 2 \times 5 = 2^2 \times 5^2$

Combining a sum of logarithmic expressions:

Example 9: Rewrite as a single logarithm.

$\log_3 x + \log_3 2$ $= \log_3(x\cdot 2) = \log_3(2x)$