Problem Definition

Problem 47. Write the expression as a logarithm applied to a single expression.

$$\frac{3}{2}\Big[ln(x(x^2+1)) - ln(x+1)\Big]$$

Solution Step 1:

The next step is to use the fact that the difference of logarithms is equal to the logarithm of the quotient. The rule is

$$log_b(x) - log_b(y) = log_b(\frac{x}{y})$$

This allows use to write

$$\frac{3}{2}\Big[ln(x(x^2+1)) - ln(x+1)\Big] = \frac{3}{2}\left[ln\frac{(x(x^2+1))}{(x+1)}\right]$$

Solution Step 1:

The first step is to use the power rule for logarithms defined as follows.

$$ylog_b(x) = log_b(x^y)$$

This allows use to write

$$\frac{3}{2}\left[ln\frac{(x(x^2+1))}{(x+1)}\right] = ln\left(\frac{(x(x^2+1))}{(x+1)}\right)^{\frac{3}{2}}$$