

Name: _____

Hour: _____

Expand the following logarithmic expressions.

1. $\log_4(9x)^3$

2. $\log\left(\frac{3x}{y}\right)^2$

3. $\log_8 \frac{x^3 y^2}{z^4}$

Condense the following logarithmic expressions.

4. $2\log_6 x - 5\log_6 y$

5. $3(\log x - \log y)$

6. $4\log_2 y + \frac{1}{3}\log_2 x^3$