

**Log Properties (YELLOW)****Expand each logarithm. Explain which properties you used to expand each logarithm.**

1.  $\log\left(\frac{6}{11}\right)^5$

4.  $\log_4\frac{x}{y^6}$

2.  $\log(3 \cdot 2^3)$

5.  $\log_8(a \cdot b)^2$

3.  $\log_3\frac{2^4}{5}$

6.  $\log_2(x \cdot y \cdot z^2)$

**Condense each logarithm. Explain which properties you used to condense each logarithm.**

7.  $4\log 3 - 4\log 8$

10.  $\log_4 u - 6\log_4 v$

8.  $\log_2 7 - 2\log_2 12$

11.  $5\log 8 + 9\log 3$

9.  $6\log_3 u + 6\log_3 v$

12.  $3\log_6 7 + \log_6 x$

**Critical Thinking.**

13.  $2(\log 2x - \log y) - (\log 3 + 2\log 5)$

14.  $\log x \cdot \log 2$