

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

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

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

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

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

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

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

$\log_2 x + \log_2 y + 2\log_2 z$

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

7. $4\log 3 - 4\log 8$ $\log\left(\frac{3}{8}\right)^4$

10. $\log_4 u - 6\log_4 v$ $\log_4 \left(\frac{u}{v^6}\right)$

8. $\log_2 7 - 2\log_2 12$ $\log_2 \frac{7}{12^2}$

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

9. $6\log_3 u + 6\log_3 v$ $\log_3 (uv)^6$

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

Critical Thinking.

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

$\log\left(\frac{(2x)^2}{3 \cdot 5^2}\right)$

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

can't simplify