

Name _____

Date _____

1. Expand: $\log_4 3xy$	2. Expand: $\ln \frac{4x^3}{y^5}$
3. Expand: $\ln a^2b^3\sqrt{c}$	4. Expand: $\log_9 \frac{4\sqrt[3]{y}}{x^4z^5}$
5. Expand: $\log_3 \frac{a}{b^2c^3}$	6. Expand: $\log \frac{xy^2z^3}{5}$
7. Expand: $\log_3 \frac{2\sqrt{x-1}}{w^4y^3}$	8. Expand: $\ln \frac{ab^3}{c^4d^{2/3}}$
9. Expand: $\log_3 \frac{k^3}{ab^2c^4}$	10. Expand: $\log_5 \frac{12ab^4}{c^3d}$

