

$$\sqrt{x} = x^{\frac{1}{2}} \quad \sqrt[3]{x} = x^{\frac{1}{3}}$$

CCGPS Advanced. Alg.

CW - 3A.2 - Expand Logarithms

Name _____

Date _____

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

