

Math Sheet

Name _____ Score _____ / 12 Teacher _____ Date _____

Properties of Logarithms

Expand or condense each logarithmic expression.

1. Expand using logarithm properties.

$$\ln(7^5 \cdot 3)$$

2. Expand using logarithm properties.

$$\log_{10}\left(\left(y \cdot z \cdot s\right)^{\frac{1}{2}}\right)$$

Domain: variables are positive $y > 0$ $z > 0$ $s > 0$

3. Expand using logarithm properties.

$$\log_7\left(\frac{3^6}{7}\right)$$

4. Expand using logarithm properties.

$$\ln\left(\frac{a^3}{u^6}\right)$$

Domain: variables are positive $a > 0$ $u > 0$

5. Expand using logarithm properties.

$$\log_{10}(9^6 \cdot 6^5 \cdot 7)$$

6. Expand using logarithm properties.

$$\log_6(r \cdot m^5 \cdot y^3)$$

Domain: variables are positive $r > 0$ $m > 0$ $y > 0$

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Properties of Logarithms

Expand or condense each logarithmic expression.

7. Condense to one logarithm.

$$5 \cdot \ln 2 + 2 \cdot \ln 8 + 5 \cdot \ln 9$$

8. Condense to one logarithm.

$$6 \cdot \log_{10} r + 6 \cdot \log_{10} p$$

Domain: variables are positive $r > 0$ $p > 0$

9. Condense to one logarithm.

$$2 \cdot \log_9 5 + \log_9 4 + \log_9 2$$

10. Condense to one logarithm.

$$\ln z + 5 \cdot \ln c$$

Domain: variables are positive $z > 0$ $c > 0$

11. Condense to one logarithm.

$$\log_{10} 3 + \log_{10} 6 + \log_{10} 4$$

12. Condense to one logarithm.

$$\log_{15} q - 2 \cdot \log_{15} a$$

Domain: variables are positive $q > 0$ $a > 0$
