

Honors Math 3 Day 4: Expanding and Condensing Logarithms

Use the Laws of Logarithms to rewrite the expression in a form with no logarithm of a product, quotient, or a power.

1. $\log_5 \left(\frac{x}{2} \right)$
2. $\ln \pi x$
3. $\log_6 \sqrt[4]{17}$
4. $\log_2 (xy)^{10}$
5. $\log_a \left(\frac{x^2}{yz^3} \right)$
6. $\ln \sqrt[3]{3r^2s}$
7. $\log \left(\frac{a^2}{b^4\sqrt{c}} \right)$
8. $\log_5 \sqrt{\frac{x-1}{x+1}}$
9. $\ln \left(\frac{3x^2}{(x+1)^{10}} \right)$
10. $\log \left(\frac{x}{\sqrt[3]{1-x}} \right)$

Rewrite the expression as a single logarithm.

11. $\log 12 + \frac{1}{2} \log 7 - \log 2$
12. $\log_5(x) - 2\log_5(y)$
13. $3\ln(a) - 2\ln(b) - 4\ln c$
14. $2(\log_5 x + 2\log_5 y - 3\log_5 z)$

Evaluate using properties

15. $\log_5(25) + 2\log_2(4)$
16. $\log_5(1) + \log_5(125)$
17. $\log_3(243) - 2\log_3(9)$