

Name _____

9-9A Lesson Master**Questions on SPUR Objectives**

See Student Edition pages 656–659 for objectives.

SKILLS Objective C

In 1–4, use properties of logarithms to solve the equation in your head.

1. $\log 14 + \log 12 = \log x$ _____
2. $\log_3 120 - \log_3 6 = \log_3 n$ _____
3. $5 \log 2 = \log t$ _____
4. $\ln 40 - \ln n = \ln 5$ _____
5. Solve for y : $\log x + \log y = \frac{1}{2} \log z$ _____
6. Solve for b : $3 \ln a - 2 \ln b = \ln (c + 5)$ _____

PROPERTIES Objective F

In 7–12, express as a single logarithm. Use paper and pencil as needed.

7. $\log 12 + \log 9$ _____
8. $\ln 5 + 2 \ln 3$ _____
9. $\log_2 12 + \log_2 3 - \log_2 6$ _____
10. $\ln (4a) - \ln a$ _____
11. $\ln a + 3 \ln b - 2 \ln c$ _____
12. $3 \log x + \frac{2}{3} \log y + \log z$ _____

In 13 and 14, write as an integer. Do all work in your head.

13. $\log 50 + \log 8 - \log 4$ _____
14. $\log_6 28 - \log_6 7 + 2 \log_6 3$ _____
15. Give a counterexample to show that $\log (a + b) \neq \log a + \log b$.

16. Write three different expressions equivalent to $\log 30$.

17. **Multiple Choice** Newton's Law of Cooling states that the time for an object to cool from O_1 degrees to O_2 degrees as the surrounding temperature changes from S_1 degrees to S_2 degrees is given by $t = k \ln \frac{(O_2 - S_2)}{(O_1 - S_1)}$ where k is a constant. Determine which of the following equations is equivalent to this. _____

A $t = k \ln \frac{(O_2 + S_2)}{(O_1 + S_1)}$

B $t = k \frac{\ln O_2 - \ln S_2}{\ln O_1 - \ln S_1}$

C $t = k(\ln (O_2 - S_2) - \ln (O_1 - S_1))$