Name

9-9B Lesson Master

Questions on SPUR Objectives
See Student Edition pages 656–659 for objectives.

SKILLS Objective C

In 1–14, use properties of logarithms to solve the equation in your head.

1. $\log x = 5 \log 4$ _____
2. $\log_5 u = \frac{1}{3} \log_5 64$ _____
3. $\log m = \log 2 + \log 14$ _____
4. $\log 28 - \log 7 = \log y$ _____
5. $\log (4z) = \log 5 + \log 4$ _____
6. $3 \log_2 4 = \log_2 m$ _____
7. $\log 6 + \log 10 = \log (5a)$ _____
8. $4 \log x = \log 32 - \log 2$ _____
9. $\log p = \log 6 + 3 \log 5$ _____
10. $\log_4 h = \frac{1}{2} \log_4 49 - \log_4 3$ _____
11. $-\frac{1}{2} \log n = \log 1 - 2 \log 9$ _____
12. $\log_8 \left(\frac{x}{2}\right) = 2 \log_8 5 + 3 \log_8 2$ _____
13. $\log_5 625 - \log_5 25 = 2 \log_5 h$ _____
14. $\log_{19}(15y) = \log_{19} 3 + \log_{19} 5$ _____
15. Solve for y: $2 \log x - \log y = \log z$ _____
16. Solve for b: $\frac{1}{3} \ln a + 2 \ln b = \ln (a - 2)$ _____
17. Solve for x: $4 \log x - 3 \log 2x = \log t$ _____
18. Solve for m: $\ln m + 3 \ln m = 2 \ln x$ _____

PROPERTIES Objective F

In 19 and 20, express as a single logarithm. Use paper and pencil as needed.

19. $\log x + 5 \log r$ _____
20. $\log_3 4 + \log_3 x - \frac{1}{2} \log_3 d$ _____

In 21–36, evaluate. Do work in your head as much as possible.

21. $\log_{12} 1$ _____
22. $\log_{27} 27^{13}$ _____
23. $\log_8 4 + \log_8 2$ _____
24. $2 \log_9 27$ _____
25. $\log_{18} 18^{20}$ _____
26. $\log_{12} 3 + \log_{12} 4$ _____
27. $4 \log_3 9$ _____
28. $\log_6 72 - \log_6 2$ _____
29. $\log_{25} 7 - \log_{25} 35$ _____
30. $\log_8 32{,}768$ _____
31. $7 \log_3 3 - 8 \log_3 3$ _____
32. $\log \sqrt[8]{100}$ _____

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33. $\frac{1}{3}\log_6 46{,}656$ _____

34. $\log_5 5^{-20}$ _____

35. $\log_4 3 - \log_4 48$ _____

36. $\log_{18} \sqrt[6]{18}$ _____

37. Fill in the Blanks The following is a proof that the equation for determining a decibel measure can be written as $D = \log N^{10} + 120$. Give a reason for each step of the proof.

Proof: $D = 10 \log \left(\frac{N}{10^{-12}}\right)$	Given
$D = 10\ (\log N - \log 10^{-12})$	a. _____
$D = 10\ (\log N - -12)$	b. _____
$D = 10\ (\log N + 12)$	Definition of Subtraction
$D = 10 \log N + 120$	Distributive Property
$D = \log N^{10} + 120$	c. _____

REVIEW Lesson 9-3, Objective G

38. Write the formula for continuously compounded interest and tell what each variable represents.

_____

_____

39. Suppose \$3200 is invested at an annual interest rate of 8.2% compounded continuously, and the money is left untouched.

a. How much is in the account after 3 years? _____

b. How much is in the account after 10 years? _____

REVIEW Lesson 9-5, Objective E

In 40–45, name the general property illustrated.

40. $\log \left(\frac{24}{5}\right) = \log 24 - \log 5$ _____

41. $\log_{16} 16^{-9} = -9$ _____

42. $\log 4 + \log 12 = \log 48$ _____

43. $6 \log_8 7 = \log_8 7^6$ _____

44. $\log \left(\frac{2}{3} \cdot 28\right) = \log \frac{2}{3} + \log 28$ _____

45. $\log \sqrt[4]{18^3} = \frac{3}{4} \log 18$ _____