Name

9-10B Lesson Master

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

SKILLS Objective A

In 1–4, approximate to the nearest thousandth and check your answer.

1. $\log_7 893$ _____
2. $\log_{0.04} 34.5$ _____
3. $\log_{43} 12$ _____
4. $\log_2 10$ _____

SKILLS Objective B

In 5–24, solve. Round solutions to the nearest hundredth, if necessary. Check your work.

5. $64^x = 4096$ _____
6. $625^x = 125$ _____
7. $12^u = 400$ _____
8. $6^a = 3$ _____
9. $10^c = 2.77$ _____
10. $196^{w+1} = 537{,}824$ _____
11. $e^x = 24$ _____
12. $5e^n = 33$ _____
13. $(0.8)^y = e^2$ _____
14. $6.5 \cdot 10^8 = e^n$ _____
15. $11^{6y-3} = 80$ _____
16. $2^r = 0.0053$ _____
17. $49^x = 343$ _____
18. $13^y = 28{,}561$ _____
19. $16^z = 8$ _____
20. $19{,}683^w = 729$ _____
21. $12^{m+5} = 17$ _____
22. $4e^n = 24$ _____
23. $(1.63)^c = e^3$ _____
24. $17^{4d-7} = 25$ _____

PROPERTIES Objective F

25. **Multiple Choice** Which of the following is *not* equal to $\log_7 35$? _____

A $\frac{\log 35}{\log 7}$ B $\frac{\log 7}{\log 35}$ C $\frac{\ln 35}{\ln 7}$ D $\frac{\log 7 + \log 5}{\log 7}$

26. **True or False** $\ln x = \frac{\log x}{\log e}$. Explain.

_____

USES Objective G

In 27–31, assume the money is left untouched in the account.

27. Jacob's college savings are invested in a bond that pays an annual interest of 6.2% compounded continuously. How long will it take the money to triple? _____

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28. Marta invested \$5000 in an account that pays an annual interest of 8.1% compounded continuously. In how many years will there be \$8000 in the account?

29. At what rate of interest, compounded continuously, would you have to invest your money for it to double in 8 years?

30. Sue Aimi wants to invest some money in a certificate of deposit paying interest at 5.8% compounded continuously. How long will it take the money to double?

31. Maria invested \$3000 in an individual retirement account (IRA) which earns an annual interest of 4.9%. How long will it take her to have \$9000 in her IRA?

32. The equation $p = 100(0.5)^{\frac{x}{5730}}$ gives the percent p of Carbon 14 (^{14}C) remaining after an organism has been decomposing for x years. How many years will it take for there to be the given percent of ^{14}C remaining?

a. 50% (Recall, this is called the *half-life*.)

b. 75%

c. 30%

33. The intensity L_t of light transmitted through a certain type of tinted glass t mm thick can be found with the formula $L_t = L_0 - 10^{-0.034t}$, where L_0 is the intensity before entering the glass. How thick should the glass be in order to block 30% of the light?

34. The population of a certain strain of bacteria grows according to the formula $N = N_0 \cdot 2^{1.71t}$, where t is the time in hours and N_0 is the initial population. How long will it take 50 bacteria to increase to 500,000?

35. In 1994, the population of the world was about 5.6 billion. The U.S. Census Bureau predicts that in the year 2020, the world's population. will reach 7.9 billion.

a. Write an exponential equation to model this situation.

b. Use this model to estimate when the world's population will reach 10 billion.