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NAME _____ DATE _____ PERIOD _____

Practice

Common Logarithms

Given that $\log 3 = 0.4771$, $\log 5 = 0.6990$, and $\log 9 = 0.9542$, evaluate each logarithm.

1. $\log 300,000$
5.4771

2. $\log 0.0005$
-3.3010

3. $\log 9000$
3.9542

4. $\log 27$
1.4313

5. $\log 75$
1.8751

6. $\log 81$
1.9084

Evaluate each expression.

7. $\log 66.3$
1.8215

8. $\log \frac{17^4}{5}$
4.2228

9. $\log 7(4^3)$
2.6513

Find the value of each logarithm using the change of base formula.

10. $\log_6 832$
3.7526

11. $\log_{11} 47$
1.6056

12. $\log_3 9$
2

Solve each equation or inequality.

13. $8^x = 10$
1.1073

14. $2.4^x \leq 20$
 $x \leq 3.4219$

15. $1.8^{x-5} = 19.8$
10.0795

16. $3^{5x} = 85$
0.8088

17. $4^{2x} > 25$
 $x > 1.1610$

18. $3^{2x-2} = 2^x$
1.4608

19. **Seismology** The intensity of a shock wave from an earthquake is given by the formula $R = \log_{10} \frac{I}{I_0}$, where R is the magnitude, I is a measure of wave energy, and $I_0 = 1$. Find the intensity per unit of area for the following earthquakes.

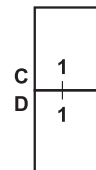
a. Northridge, California, in 1994, $R = 6.7$
about 5,011,872

b. Hector Mine, California, in 1999, $R = 7.1$
about 12,589,254

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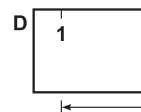
The Slide

Before the invention of the slide rule, people often performed calculations using logarithms. Each of the slides shown below is a slide rule.



To multiply two numbers, you use the slide rule as shown below. The slide rule is used to find the logarithm of the product of the two numbers.

← log



1-2 See s

Follow the s

- Use graph paper. Draw a grid of squares to the right, plot the whole number on the horizontal axis, and a heavy dot on the vertical axis.
- You will need a 5-by-7 inch grid. You will work in Exercise 1. Use a logarithm scale on the grid strips. The strips are being drawn.
- Explain how to find the logarithm of 8 by 2. **1**
scale w
scale.
number
the 1 o