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Lesson 4: Log-Arithm-etic

Ready, Set, Go



Ready

1. Factor out the greatest common factor in the expression. Then simplify the numbers inside the parentheses.

Factor out the GCF	Factored Form	Simplified Expression
$7 + 7(0.675)$		
$19 + 19(0.33)$		
$38 - 38(0.42)$		
$67 - 67(0.92)$		



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2. Jaxon has invested \$500 in an excellent money market account that earns 20% per year. Given is a chart of his year-end balances that appeared on his investment statements.

Beginning Balance	End of year 1	End of year 2	End of year 3
\$500	\$600	\$720	\$864

Jaxon's money is growing exponentially, and he recalls from a previous math class that the formula for an exponential function is $y = ab^x$. He recalls that $a = \$500$ and $x = \#$ years. He thinks b should equal 20% (0.2), but that number isn't giving him the numbers on his bank statement. What number should he be using for b ? Explain.

3. Jackie owes \$500 on a loan. She has agreed to pay the loan company 8% of the outstanding balance on the first day of each month. Given is a chart of the balances she owes after each payment.

Initial Amount Owed	Month 1	Month 2	Month 3
\$500	\$460	\$423.20	\$389.34

Jackie knows her loan balance is decreasing exponentially. She also recalls from a previous math class that the formula for an exponential function is $y = ab^x$. She replaces a with \$500 and lets x be the number of monthly payments. But when she uses 8% (0.08) in the formula for b , it doesn't give her the correct balance for each month. What number should she be using for b ? Explain.



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**Set**

Use properties of logarithms to rewrite the indicated logarithms in terms of the given values, then find the indicated logarithm using the given approximate values.

Do not use a calculator to evaluate the logarithms.

Given:

$$\log 16 \approx 1.2$$

$$\log 5 \approx 0.7$$

$$\log 8 \approx 0.9$$

4. Find $\log \frac{5}{8}$

5. Find $\log 25$

6. Find $\log \frac{1}{2}$

7. Find $\log 80$

8. Find $\log \frac{1}{64}$



Given:

$$\log_3 2 \approx 0.6$$

$$\log_3 5 \approx 1.5$$

9. Find $\log_3 16$



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10. Find $\log_3 108$

11. Find $\log_3 \frac{3}{50}$

12. Find $\log_3 \frac{8}{15}$

13. Find $\log_3 486$

14. Find $\log_3 18$

15. Find $\log_3 120$

16. Find $\log_3 \frac{32}{45}$



Use your calculator and the definition of $\log x$ to find the value of x . (Round your answers to four decimals.)

17. $\log x = -3$

18. $\log x = 1$

19. $\log x = 0$



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20. $\log x = \frac{1}{2}$

21. $\log x = 1.75$

22. $\log x = -2.2$

23. $\log x = 3.67$

24. $\log x = \frac{3}{4}$

25. $\log x = 6$