

READY, SET, GO!

Name \_\_\_\_\_

Period \_\_\_\_\_

Date \_\_\_\_\_

**READY**

Topic: Solving simple exponential and logarithmic equations

You have solved exponential equations before based on the idea that  $a^x = a^y$ , *if and only if*  $x = y$ .You can use the same logic on logarithmic equations.  $\log_a x = \log_a y$ , *if and only if*  $x = y$ **Rewrite each equation so that you set up a one-to-one correspondence between all of the parts. Then solve for  $x$ .**

Example: Original equation	Rewritten equation:	Solution:
a.) $3^x = 81$	$3^x = 3^4$	$x = 4$
b.) $\log_2 x - \log_2 5 = 0$	$\log_2 x = \log_2 5$	$x = 5$

1.  $3^{x+4} = 243$

2.  $\left(\frac{1}{2}\right)^x = 8$

3.  $\left(\frac{3}{4}\right)^x = \frac{27}{64}$

4.  $\log_2 x - \log_2 13 = 0$

5.  $\log_2(2x - 4) - \log_2 8 = 0$

6.  $\log_2(x + 2) - \log_2 9x = 0$

7.  $\frac{\log 2x}{\log 14} = 1$

8.  $\frac{\log(5x-1)}{\log 29} = 1$

9.  $\frac{\log 5^{(x-2)}}{\log 625} = 1$

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**SET**

Topic: Rewriting logs in terms of known logs

**Use the given values and the properties of logarithms to find the indicated logarithm.**

Do not use a calculator to evaluate the logarithms.

**Given:**  $\log 16 \approx 1.2$   
 $\log 5 \approx 0.7$   
 $\log 8 \approx 0.9$

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

11. Find  $\log 25$

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

13. Find  $\log 80$

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

**Given**  $\log_3 2 \approx 0.6$   
 $\log_3 5 \approx 1.5$

15. Find  $\log_3 16$

16. Find  $\log_3 108$

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

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

19. Find  $\log_3 486$

20. Find  $\log_3 18$

21. Find  $\log_3 120$

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

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