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

2. $\left(\frac{1}{2}\right)^x = 8$ $x = -3$

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

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

5. $log_2(2x - 4) - log_2 8 = 0$ $x = 6$

6. $log_2(x + 2) - log_2 9x = 0$ $x = \frac{1}{4}$

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

8. $\frac{\log(5x-1)}{\log 29} = 1$ $x = 6$

9. $\frac{\log 5^{(x-2)}}{\log 625} = 1$ $x = 6$

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 $\log \frac{5}{8}$ ≈ -0.2

11. Find $\log 25$ ≈ 1.4

12. Find $\log \frac{1}{2}$ ≈ 0.3

13. Find $\log 80$ ≈ 1.9

14. Find $\log \frac{1}{64}$ ≈ -1.8

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

15. Find $\log_3 16$ ≈ 2.4

16. Find $\log_3 108$ ≈ 4.2

17. Find $\log_3 \frac{3}{50}$ ≈ -3.4

18. Find $\log_3 \frac{8}{15}$ ≈ -2.3

19. Find $\log_3 486$ ≈ 5.6

20. Find $\log_3 18$ ≈ 2.6

21. Find $\log_3 120$ ≈ 4.3

22. Find $\log_3 \frac{32}{45}$ ≈ -0.5