

Questions on 2.4?

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

$\log_{14} 2x = 1$

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

$\log_2 3 = \frac{\log 3}{\log 2}$

$\log_{10} 2x = \log_{10} 14$

$\frac{2x}{2} = \frac{14}{2}$

$x = 7$

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Secondary Mathematics III

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$x = 8$

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

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

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

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

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

8. $\frac{\log_3(x-1)}{\log_3 29} = 1$

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

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Topic: Using the definition of logarithm to solve for x.

Use your calculator and the definition of $\log x$ (recall: the base is 10) to find the value of x.
(Round your answers to 4 decimals.)

23. $\log x = -3$ 24. $\log x = 1$ 25. $\log x = 0$

$10^{-3} = x$ $10^1 = x$

26. $\log x = \frac{1}{2}$ 27. $\log x = 1.75$ 28. $\log x = -2.2$

29. $\log x = 3.67$ 30. $\log x = \frac{3}{4}$ 31. $\log x = 6$

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2.5 Powerful Tens

A Practice Understanding Task

Table Puzzles

1. Use the tables to find the missing values of x :

a.

x	$y = 10^x$
-2	$\frac{1}{100}$
1	10
	50
	100
3	1000



b.

x	$y = 3(10^x)$
	0.3
0	3
	94.87
2	300
	1503.56

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c. What equations could be written, in terms of x only, for each of the rows that are missing the x in the two tables above?

d.

x	$y = \log x$
0.01	-2
	-1
10	1
	1.6
100	2

e.

x	$y = \log(x + 3)$
	-2
-2.9	-1
	0.3
7	1
	3

f. What equations could be written, in terms of x only, for each of the rows that are missing the x in the two tables above?

2. What strategy did you use to find the solutions to equations generated by the tables that contained exponential functions?
3. What strategy did you use to find the solutions to equations generated by the tables that contained logarithmic functions?

Graph Puzzles

4. The graph of $y = 10^{-x}$ is given below. Use the graph to solve the equations for x and label the solutions.

a. $40 = 10^{-x}$

$x = -1.5$

Label the solution with an A on the graph.

b. $10^{-x} = 10$

$x = \underline{\hspace{2cm}}$

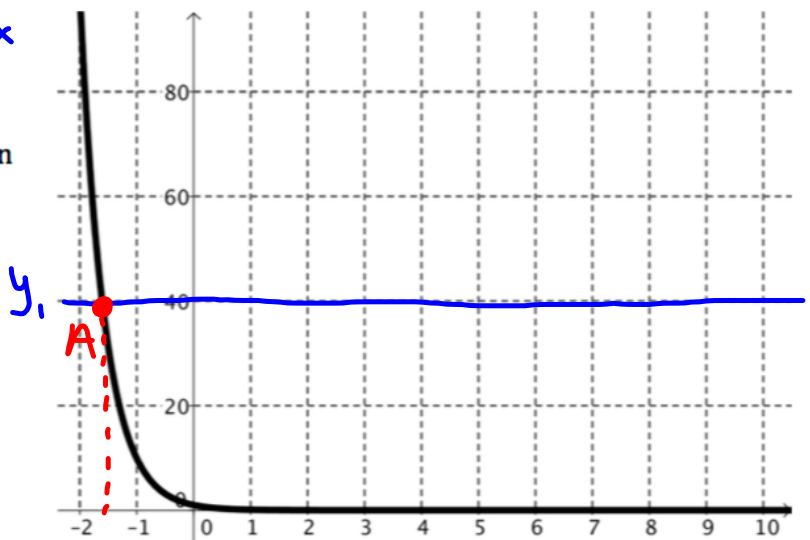
Label the solution with a B on the graph.

c. $10^{-x} = 0.1$

$x = \underline{\hspace{2cm}}$

Label the solution with a C on the graph.

$y_1 = 40$
 $y_2 = 10^{-x}$



5. The graph of $y = -2 + \log x$ is given below. Use the graph to solve the equations for x and label the solutions.

a. $-2 + \log x = -2$

$x = \underline{\hspace{2cm}}$

Label the solution with an A on the graph.

b. $-2 + \log x = 0$

$x = \underline{\hspace{2cm}}$

Label the solution with a B on the graph.

c. $-4 = -2 + \log x$

$x = \underline{\hspace{2cm}}$

Label the solution with a C on the graph.

d. $-1.3 = -2 + \log x$

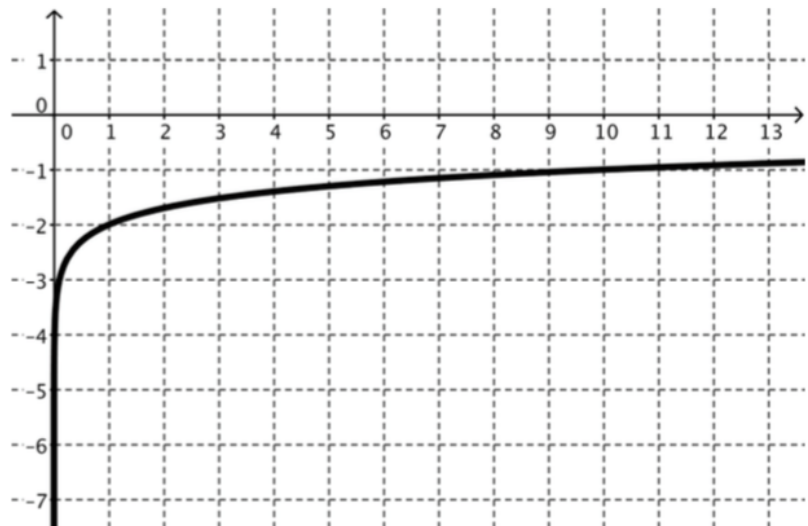
$x = \underline{\hspace{2cm}}$

Label the solution with a D on the graph.

e. $1 = -2 + \log x$

$x = \underline{\hspace{2cm}}$

6. Are the solutions that you found in #5 exact or approximate? Why?



Equation Puzzles:

Solve each equation for x :

7. $10^x = 10,000$

8. $125 = 10^x$

9. $10^{x+2} = 347$

10. $5(10^{x+2}) = 0.25$

11. $10^{-x-1} = \frac{1}{36}$

12. $-(10^{x+2}) = 16$

Homework

Finish 2.5 "Ready, Set, Go"