

LOGS HOMEWORK – HOMEWORK: LOGS*

Kenny M. Felder

This work is produced by OpenStax-CNX and licensed under the Creative Commons Attribution License 2.0[†]

Abstract

This module provides practice problems related to logarithms.

$\log_2 8$ asks the question: “**2 to what power is 8?**” Based on that, you can answer the following questions:

Exercise 1

$$\log_2 8 =$$

Exercise 2

$$\log_3 9 =$$

Exercise 3

$$\log_{10} 10 =$$

Exercise 4

$$\log_{10} 100 =$$

Exercise 5

$$\log_{10} 1000 =$$

Exercise 6

$$\log_{10} 1,000,000 =$$

Exercise 7

Looking at your answers to exercises #3-6, what does the \log_{10} tell you about a number?

Exercise 8

Multiple choice: which of the following is closest to $\log_{10} 500$?

- A. 1
- B. $1\frac{1}{2}$
- C. 2
- D. $2\frac{1}{2}$
- E. 3

Exercise 9

$$\log_{10} 1 =$$

Exercise 10

$$\log_{10} \frac{1}{10} =$$

*Version 1.2: Apr 15, 2009 11:20 am -0500

[†]<http://creativecommons.org/licenses/by/2.0/>

Exercise 11

$$\log_{10} \frac{1}{100} =$$

Exercise 12

$$\log_2(0.01) =$$

Exercise 13

$$\log_{10} 0 =$$

Exercise 14

$$\log_{10}(-1) =$$

Exercise 15

$$\log_9 81 =$$

Exercise 16

$$\log_9 \frac{1}{9} =$$

Exercise 17

$$\log_9 3 =$$

Exercise 18

$$\log_9 \frac{1}{81} =$$

Exercise 19

$$\log_9 \frac{1}{3} =$$

Exercise 20

$$\log_5(54) =$$

Exercise 21

$$5^{\log_5 4} =$$

OK. When I say $\sqrt{36} = 6$, that's the **same thing** as saying $6^2 = 36$. Why? Because $\sqrt{36}$ asks a question: "What squared equals 36?" So the equation $\sqrt{36} = 6$ is providing an answer: "**six** squared equals 36."

You can look at logs in a similar way. If I say $\log_2 32 = 5$ I'm asking a question: "2 to what power is 32?" And I'm answering: "two to the **fifth** power is 32." So saying $\log_2 32 = 5$ is the **same thing** as saying $2^5 = 32$.

Based on this kind of reasoning, **rewrite the following logarithm statements as exponent statements.**

Exercise 22

$$\log_2 8 = 3$$

Exercise 23

$$\log_3 \frac{1}{3} = -1$$

Exercise 24

$$\log_x(1) = 0$$

Exercise 25

$$\log_a x = y$$

Now do the same thing backward: **rewrite the following exponent statements as logarithm statements.**

Exercise 26

$$4^3 = 64$$

Exercise 27

$$8 - \frac{2}{3} = \frac{1}{4}$$

Exercise 28

$$a^b = c$$

Finally...you don't understand a function until you graph it...

Exercise 29

- a. Draw a graph of $y = \log_2 x$. Plot at least 5 points to draw the graph.
- b. What are the domain and range of the graph? What does that tell you about this function?