

AGENDA

Objective: **SWBAT Review for Logarithms Unit test**

Language Objective: **SWBAT**

- 1) Take out HW to be checked
- 2) Review sheet

HW: Finish review sheet to prepare for:
Unit Test next class
C block- Tuesday
E block- Wednesday

Logarithm Review Sheet

Recall that $x = \log_a y \Leftrightarrow y = a^x$

1) Write each of the following as a logarithmic expression.

a) $10^4 = 10,000$

b) $4^{-5} = \frac{1}{1024}$

c) $10^{0.4771} = 3$

d) $p^k = 3$

e) $x^2 = 7.3891$

f) $x^{-4} = 0.0183$

2) Write each of the following as an exponential equation.

a) $t = \log_3 8$

b) $\log_5 25 = 2$

c) $\log_6 6 = 1$

d) $\log 0.01 = -2$

e) $\log_c m = 17$

f) $\log_t 0.989 = -0.0111$

3) Solve each of the following.

a) $\log_3 x = 4$

b) $\log_5 25 = x$

c) $\log_x 64 = 3$

d) $\log_x 8 = 1$

e) $\log_3 x = -2$

f) $\log_{32} x = \frac{2}{3}$

Logarithm Review Sheet

Recall that $x = \log_a y \Leftrightarrow y = a^x$

1) Write each of the following as a logarithmic expression.

a) $10^4 = 10,000$

$$\log_{10}(10,000) = 4$$

b) $4^{-5} = \frac{1}{1024}$

$$\log_4(1/1024) = -5$$

c) $10^{0.4771} = 3$

$$\log_{10}(3) = 0.4771$$

d) $p^k = 3$

$$\log_p(3) = k$$

e) $x^2 = 7.3891$

$$\log_x(7.3891) = 2$$

f) $x^{-4} = 0.0183$

$$\log_x(0.0183) = -4$$

2) Write each of the following as an exponential equation.

a) $t = \log_3 8$

$$3^t = 8$$

b) $\log_5 25 = 2$

$$5^2 = 25$$

c) $\log_6 6 = 1$

$$6^1 = 6$$

d) $\log 0.01 = -2$

$$10^{-2} = 0.01$$

e) $\log_c m = 17$

$$c^{17} = m$$

f) $\log_t 0.989 = -0.0111$

$$t^{-0.0111} = 0.989$$

3) Solve each of the following.

a) $\log_3 x = 4$

$$3^4 = 81$$

b) $\log_5 25 = x$

$$2 = x$$

c) $\log_x 64 = 3$

$$x = 4$$

d) $\log_x 8 = 1$

$$x = 8$$

e) $\log_3 x = -2$

$$x = 1/9$$

f) $\log_{32} x = \frac{2}{3}$

$$(32)^{2/3} = x$$

$$x = 10.08$$

4) Evaluate each of the following.

a) $\log_5 25$

b) $\log_6 1$

c) $\log_2 16$

d) $7^{\log_7 23}$

e) $\log_2 8$

d) $\log_n n^8$

5) Use the change of base rule to evaluate the following.

a) $\log_4 27$

b) $\log_8 60$

c) $\log 14$

d) $\log_7 3$

~~d) $\log_e 17$~~

d) $\log_9 55$

6) Expand each of the following logarithmic expression.

a) $\log_a \frac{x^2}{y^3 z}$

b) $\log_c \frac{x^6 y^3}{a^2 z^5}$

7) Condense each of the following into a single logarithm.

a) $4\log x + 3\log y$

b) $\frac{1}{2}\log_a x + 3\log_a y - 2\log_a x$

4) Evaluate each of the following.

a) $\log_5 25$

2

b) $\log_6 1$

0

c) $\log_2 16$

d) $7^{\log_7 23}$

23

e) $\log_2 8$

3

d) $\log_n n^8$

8

5) Use the change of base rule to evaluate the following.

a) $\log_4 27$

2.38

b) $\log_8 60$

1.97

c) $\log 14$

1.15

d) $\log_7 3$

0.56

~~d) $\log_e 17$~~

d) $\log_9 55$

1.82

6) Expand each of the following logarithmic expression.

a) $\log_a \frac{x^2}{y^3 z}$

$$\downarrow$$

 $2 \cdot \log_a(x) - 3 \cdot \log_a(y) - \log_a(z)$

b) $\log_c \frac{x^6 y^3}{a^2 z^5}$

$6 \cdot \log_c(x) + 3 \cdot \log_c(y) - 2 \cdot \log_c(a) - 5 \cdot \log_c(z)$

7) Condense each of the following into a single logarithm.

a) $4 \log x + 3 \log y$

$\log(x^4 y^3)$

b) $\frac{1}{2} \log_a x + 3 \log_a y - 2 \log_a x$

$\log_a(y^3 / x^{3/2})$

** challenge*
8) Solve each of the following.

a) $5^{2x-3} = 25$

b) $4^{2x-1} = 64^{x+3}$

9) Solve each of the following.

a) $8^x = 10$

b) $x^{0.03} = 5$

~~c) $2^x = 3^{x-1}$~~

10) Solve each of the following.

a) $\log_2(8 - 6x) = 5$

b) $3\log x = -3$

11) Solve and check for extraneous solutions.

~~a) $\log_4(x+3) = \log_4(x-5) = 2$~~

b) $\log(x+3) + \log(x+2) = \log 20$

12) A ball is dropped from a height of 100 ft. and with each succeeding bounce, it rises up $5/8$ s of the previous bounce. How many bounces must occur in order for the ball to bounce less than 2 feet from the ground?

* challenge

8) Solve each of the following.

a) $5^{2x-3} = 25$

$$2x-3 = 2$$

$$x = 5/2$$

*

b) $4^{2x-1} = 64^{x+3}$

$$4^{2x-1} = 4^{3(x+3)}$$

$$2x-1 = 3x+9$$

$$x = -10$$

9) Solve each of the following.

a) $8^x = 10$

$$x = 1.107$$

b) $x^{0.03} = 5$

$$x = 1.99 \cdot 10^{27}$$

~~c) $2^x = 3^{x+1}$~~

10) Solve each of the following.

a) $\log_2(8-6x) = 5$

$$2^5 = (8-6x)$$

$$32 = 8 - 6x$$

$$24 = -6x$$

$$-4 = x$$

b) $3\log x = -3$

$$\log(x) = -1$$

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

$$0.1 = x$$

11) Solve and check for extraneous solutions.

~~a) $\log_4(x+3) - \log_4(x-5) = 2$~~

b) $\log(x+3) + \log(x+2) = \log 20$

$$\log((x+3)(x+2)) = \log(20)$$

$$(x+3)(x+2) = 20$$

$$x^2 + 5x + 6 = 20$$

$$x^2 + 5x - 14 = 0$$

$$(x+7)(x-2) = 0 \quad x = 2 \text{ or } -7$$

12) A ball is dropped from a height of 100 ft. and with each succeeding bounce, it rises up 5/8s of the previous bounce. How many bounces must occur in order for the ball to bounce less than 2 feet from the ground?

$$2 = 100(5/8)^t$$

$$0.02 = (5/8)^t$$

$$\log(5/8)^t = \log(0.02)$$

$$8.32 = t = 9 \text{ bounces}$$