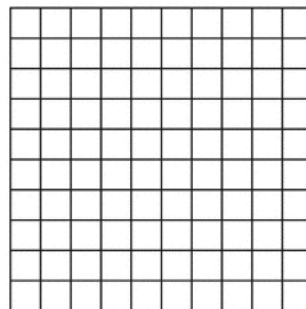


Aim: How do we work with logarithms?**I. Do Now:**1. Solve for x :

(a) $x^2 = 16$ (b) $x^3 = 8$ *(c) $2^x = 10$

2. Graph and label each equation on the same set of axes.



(a) $y = 2^x$

(b) $y = 2^{-x}$

(c) the inverse
of $y = 2^x$ **II. Development:****III. Applications:**

A) Find each log without using a calculator:

1. $\log_2 16 =$

2. $\log_3 27 =$

3. $\log_4 2 =$

4. $\log_{10} 1 =$

5. $\log_8 8 =$

6. $\log_{10} \left(\frac{1}{1000}\right) =$

B) Find each log to 3 decimal places:

7. $\log_{10} 500 =$

8. $2(\log_{10} 2) =$

9. $\log_{10} (-4) =$

IV. Basic Properties of Logarithms

(1) $\log_a 1 =$

(2) $\log_a a =$

(3) $\log_a a =$

(4) $\log_a x = \log_a y \Rightarrow$

V. Find each log to 3 decimal places:

(a) $\log 2 =$

(c) $\log 20 =$

(e) $\log 6 =$

(b) $\log 3 =$

(d) $\log 300 =$

(f) $\log 9 =$

What do you notice?

VI. More Properties of Logarithms

(5)

(6)

(7)

Note: The logarithmic function with base 10 is called the *common logarithmic function* and is represented by \log .**VII. More Applications:**

Use the properties of logs to expand the following:

10. $\log(3x^3y^2) =$

11. $\log\left(\frac{\sqrt{3x-5}}{7x^3}\right) =$

12. $\log\left(\frac{4x^3}{y}\right)^2 =$

Use the properties of logs to condense the following (i.e., express as a single logarithm):

13. $2\log(x+2) - \frac{1}{3}(\log x + \log y) =$

14. $\log x - 3\log(x+1) =$

Given that $\log 2 \approx 0.301$, find each of the following without using a calculator:

15. $\log 2^3 =$

18. $\log \sqrt{2} =$

16. $\log 20 =$

19. $\log \frac{1}{2} =$

17. $\log 2000 =$

20. $\log 0.02 =$

HW9

Read pages 192 – 193, 203 – 205.

p. 189: 21, 23

p. 199: 7, 9, 17, 19, 23, 24, 25

p. 207: 47, 50, 64, 71, 73, 93, 94, 96, 99