

Name: \_\_\_\_\_ Period: \_\_\_\_\_

### Sec 3 Test 2 Review Homework Logarithmic Functions

1. Put these logarithmic expressions in order from smallest to largest by writing the *letter* that corresponds with each expression in the spaces below.

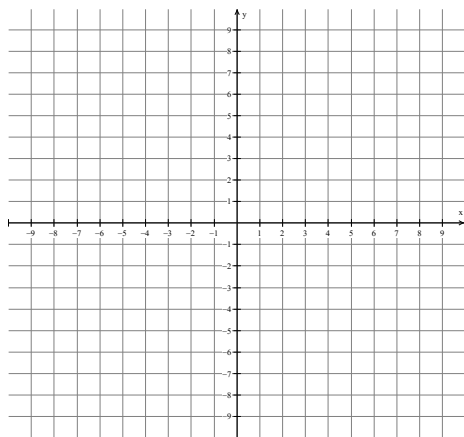
- (A)  $\log_2 2$                       (B)  $\log_5 625$                       (C)  $\log_9 \frac{1}{81}$                       (D)  $\log_4 1$                       (E)  $\log_3 243$

\_\_\_\_\_

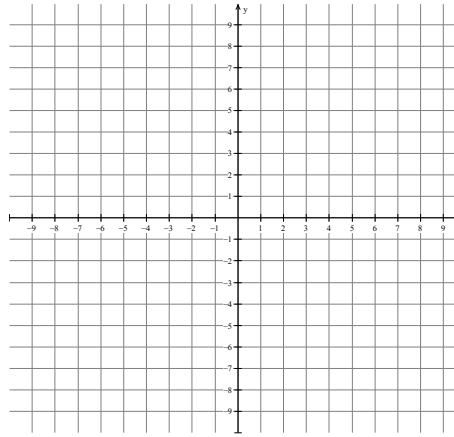
Smallest  $\longrightarrow$  Largest

**Graph the following functions. Mark and label at least two points on each graph.**

2a.  $f(x) = 3^x$



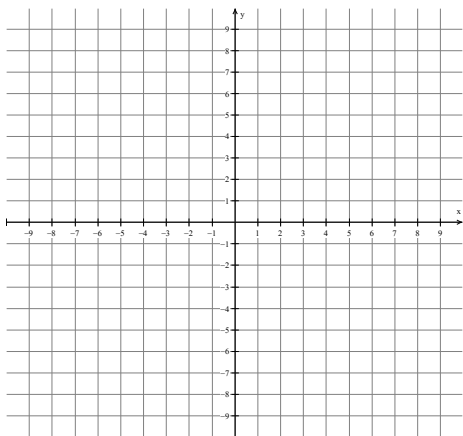
b.  $f(x) = 3^x + 4$



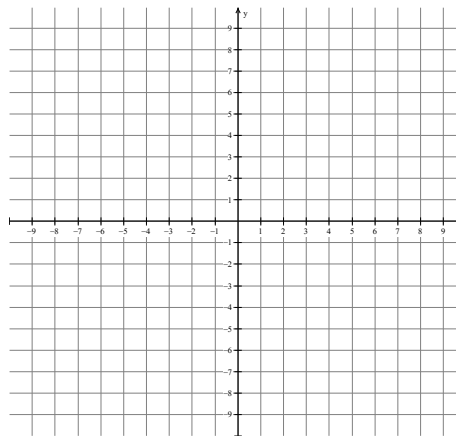
c. Describe the Translation: \_\_\_\_\_



3a.  $f(x) = \log_3 x$



b.  $f(x) = \log_3(x - 3)$



c. Describe the Translation: \_\_\_\_\_



Graph Translations: *Use properties of logarithms to expand and simply each expression completely then graph the translations, shifting ALL POINTS.*

4.a.  $f(x) = \log_4 \frac{x}{4}$

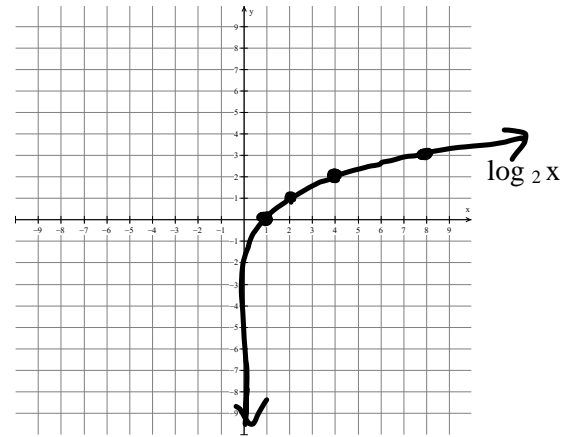
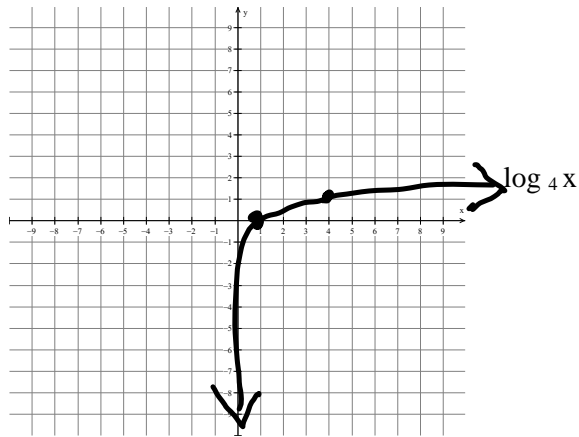
= \_\_\_\_\_

5.a.  $f(x) = \log_2(16x)$

= \_\_\_\_\_

b. Describe the translation to  $\log_4 x$  \_\_\_\_\_

b. Describe the translation to  $\log_2 x$  \_\_\_\_\_



*Use properties of logarithms to expand each expression completely.*

6.  $\log_7(8x^3)$

7.  $\log_2\left(\frac{6x}{5}\right)$

*Evaluate the following logarithms. (Show factor tree)*

8.  $\log 1000$

9.  $\log_3 \frac{1}{81}$

10.  $\log_4 64$

*Use  $\log_4 5 \approx 1.2$  and  $\log_4 3 \approx 0.8$ , along with properties of logarithms, to evaluate the following. Show all of your steps.*

11.  $\log_4 15$

12.  $\log_4 \frac{1}{9}$

13.  $\log_4 \frac{45}{4}$

*Solve the logarithmic equation for x. Show all of your work.*

14.  $\log_3(x+3) - \log_3 9 = 0$

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

*Simplify, show all of your work.*

16.  $(3a^6b^3)^2$

17.  $5^{3p-2} = 5^7$

18.  $25(8^2)^0$

Find the INVERSE of each function:

19.  $f(x) = 7x - 2$

20.  $F(x) = \frac{x-5}{4}$

21. Given  $f(x) = 5x - 12$  and  $g(x) = \frac{x+12}{5}$ . Show  $f(g(x))$  and answer if they are inverses.