

7-3

Practice

Form K

Logarithmic Functions as Inverses

Write each equation in logarithmic form.

1. $32 = 2^5$

2. $243 = 3^5$

3. $625 = 5^4$

Write each equation in exponential form.

4. $\log_3 9 = 2$

5. $\log_5 125 = 3$

6. $\log_8 512 = 3$

Evaluate each logarithm.

7. $\log_9 27$

8. $\log_8 256$

9. $\log_{125} \frac{1}{25}$

$$\log_9 27 = x$$

$$27 = 9^x$$

$$3^3 = (3^2)^x$$

$$3^3 = 3^{2x}$$

$$3 = 2x$$

$$x =$$

$$\log_8 256 = x$$

$$256 = 8^x$$

The formula $\log \frac{I_1}{I_2} = M_1 - M_2$ is used to compare the intensity levels of earthquakes. The variable I is the intensity measured by a seismograph. The variable M is the measurement on the Richter scale. Use the formula to answer the following problem.

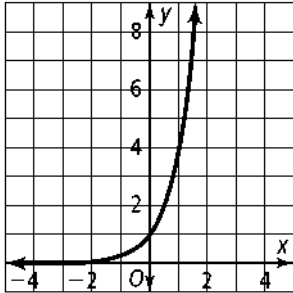
10. In 1906, an earthquake of magnitude 8.25 hit San Francisco, California. Indonesia was hit by an earthquake of magnitude 8.5 in 1938. Compare the intensity of the two earthquakes.

7-3 Practice (continued)

Logarithmic Functions as Inverses

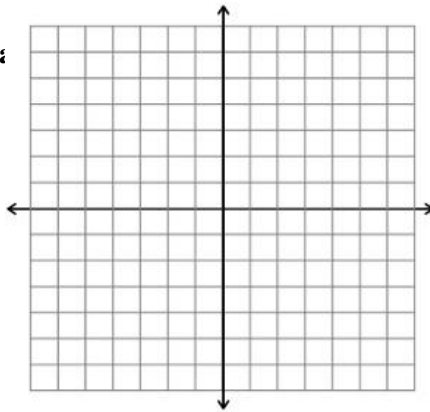
Form K

- 11. Error Analysis** A student drew the graph below to represent the function $y = \log_4 x$. What mistake did the student make when she drew her graph?

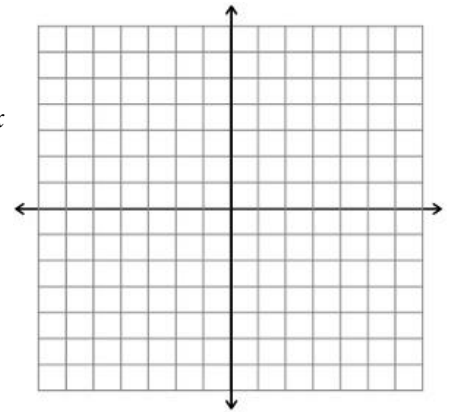


Graph each log:

12. $y = \log_2 x$



13. $y = \log_{\frac{1}{3}} x$



Identify each function as a compression, a stretch, or a translation of the parent function.

14. $y = 4 \log_3 x$

15. $y = \log_2 x + 10$

16. $y = 0.25 \log_4 x$

Transform the function $y = \log_5 x$ as indicated below.

- 17.** stretch by a factor of 3 and translate 6 units up

- 18.** compress by a factor of 0.4 and reflect in the x -axis