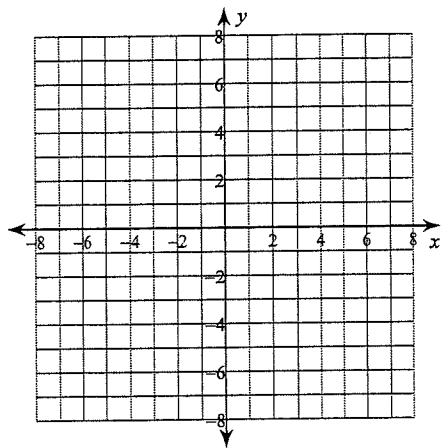


## Logarithms Graphing and Properties Homework

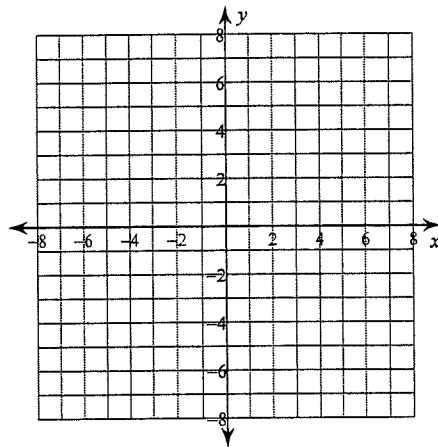
Date \_\_\_\_\_ Period \_\_\_\_\_

Sketch the graph of each function. Describe the translation.

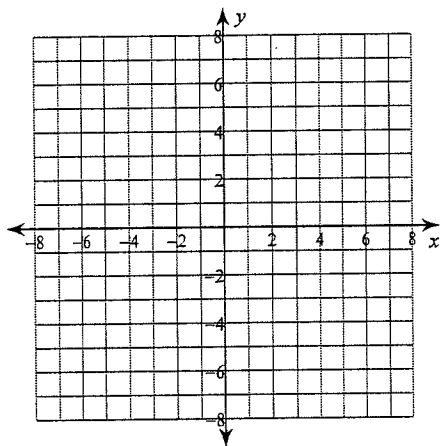
1)  $y = \log_2(x - 1) - 4$



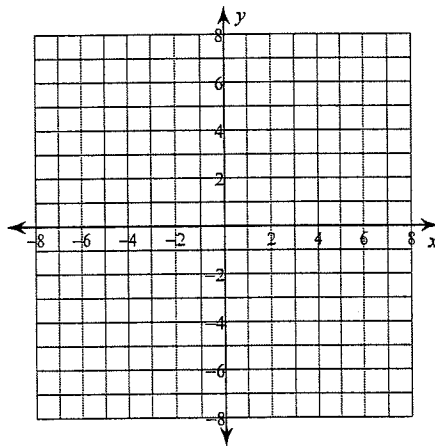
2)  $y = \log_3(x - 1) + 4$



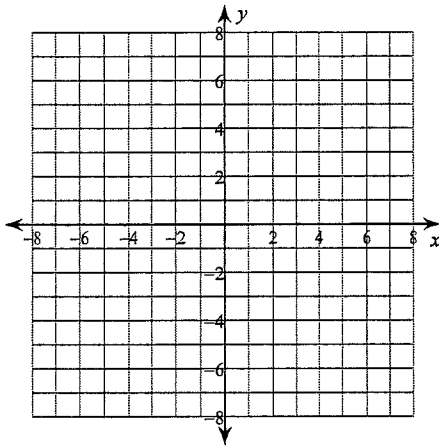
3)  $y = \log_6(x - 1)$



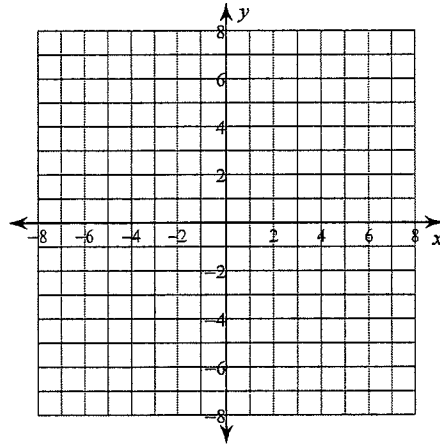
4)  $y = \log_6(x - 1) - 3$



$$5) y = \log_4(x + 4) - 1$$



$$6) y = \log_4(x - 1) - 2$$



**Expand each logarithm.**

$$7) \log(12 \cdot 11)$$

$$8) \log \frac{6}{11}$$

$$9) \log(8 \cdot 7)$$

$$10) \log(2 \cdot 3)$$

$$11) \log \frac{x}{y}$$

$$12) \log(x \cdot y)$$

$$13) \log_7 \frac{u}{v^2}$$

$$14) \log_7(a \cdot b \cdot c)$$