

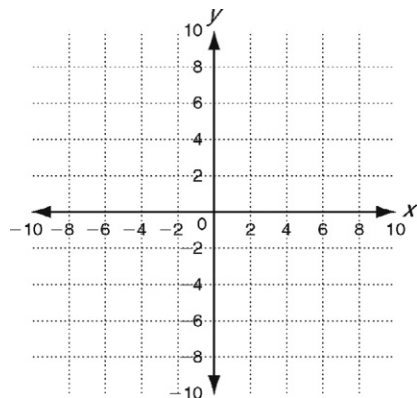
**LESSON**  
**15-2**

# Graphing Logarithmic Functions

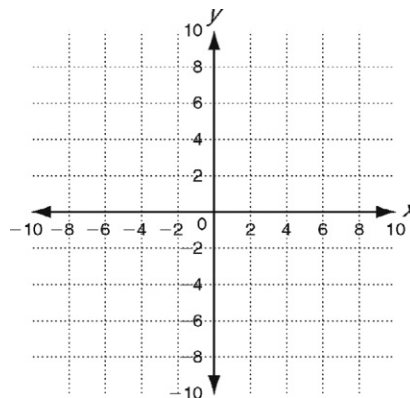
## Practice and Problem Solving: A/B

Graph each function. Find the asymptote. Tell how the graph is transformed from the graph of its parent function.

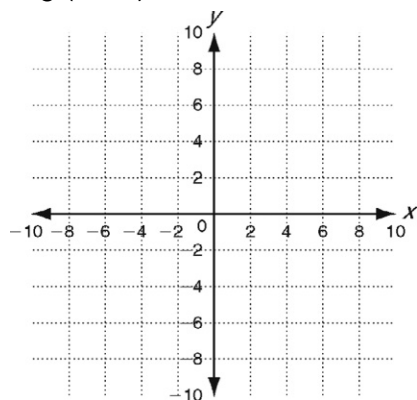
1.  $f(x) = \log_2 x + 4$



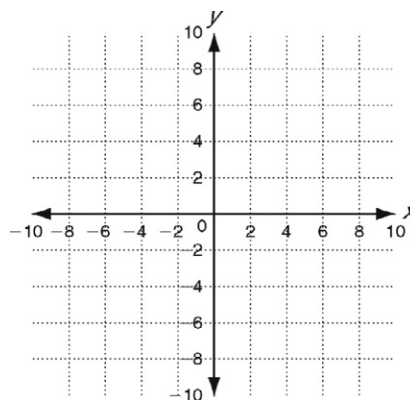
2.  $f(x) = 3\log_4(x + 6)$



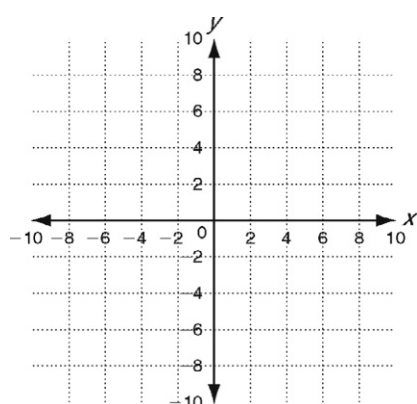
3.  $f(x) = \log(x + 5)$



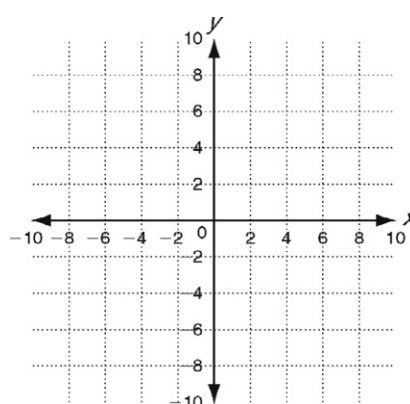
4.  $f(x) = 3 + \ln x$



5.  $f(x) = 2.5\log_2(x + 7) - 3$



6.  $f(x) = -0.8 \ln(x - 1.5) + 2$



**Write each transformed function.**

7. The function  $f(x) = \log(x + 1)$  is reflected across the  $x$ -axis and translated down 4 units. \_\_\_\_\_
8. The function  $f(x) = \log_8(x - 3)$  is compressed vertically by a factor of  $\frac{2}{5}$  and translated up 11 units. \_\_\_\_\_
9. The function  $f(x) = -\log_9(x + 4)$  is translated 4 units right and 1 unit down and vertically stretched by a factor of 7. \_\_\_\_\_
10. The function  $f(x) = 3 \ln(2x + 8)$  is vertically stretched by a factor of 3, translated 7 units up, and reflected across the  $x$ -axis. \_\_\_\_\_
11. The function  $f(x) = -\log(5 - x) - 2$  is translated 6 units left, vertically compressed by a factor of  $\frac{1}{3}$ , and reflected across the  $x$ -axis. \_\_\_\_\_
12. The function  $f(x) = 8\log_7 x - 5$  is compressed vertically by a factor of 0.5, translated right 1 unit, and reflected across the  $x$ -axis. \_\_\_\_\_
13. What transformations does the function  $f(x) = -\ln(x + 1) - 2$  undergo to become the function  $g(x) = \ln(x - 1)$ ? \_\_\_\_\_

**Solve.**

14. The function  $A(t) = Pe^{rt}$  is used to calculate the balance,  $A$ , of an investment in which the interest is compounded continuously at an annual rate,  $r$ , over  $t$  years. Find the inverse of the formula. Describe what information the inverse gives.  
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15. The function  $A(t) = Pe^{rt}$  is used to calculate the balance,  $A$ , of an investment where the interest is compounded continuously at an annual rate,  $r$ , over  $t$  years. Find the inverse of the formula. Then use it to determine the amount of time it will take a \$27,650 investment at 3.95% to reach a balance of \$50,000.  
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