Name _____ Date _____ Class _____

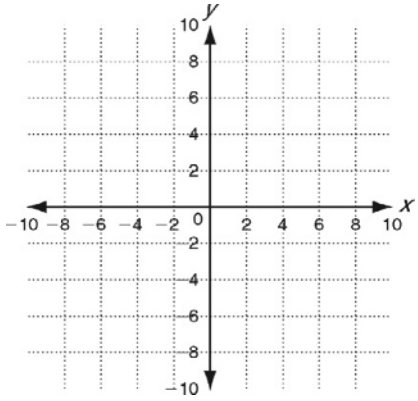
LESSON 15-2

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



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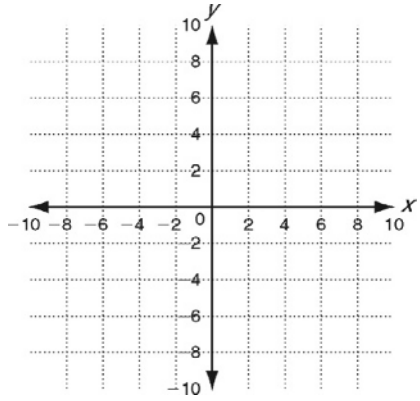
2. $f(x) = 3\log_4 (x + 6)$



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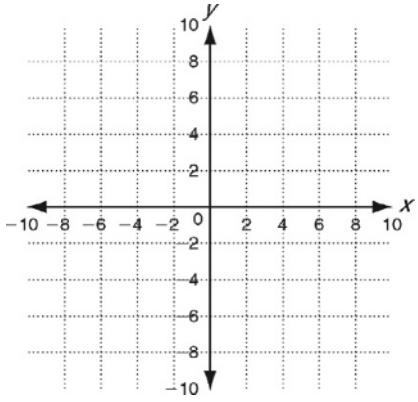
3. $f(x) = \log (x + 5)$



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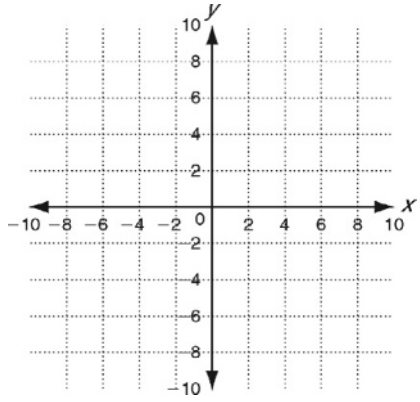
4. $f(x) = 3 + \ln x$



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Write each transformed function.

5. The function $f(x) = \log (x + 1)$ is reflected across the x-axis and translated down 4 units.

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6. The function $f(x) = \log_8 (x - 3)$ is compressed vertically by a factor of $\frac{2}{5}$ and translated up 11 units.

_____

Solve.

7. 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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24. $x = 2$

25. $x = 4$

26. $x = 9$

27. $x = 4$

28. $x = 3$

29. $x = 2$

30. $x = 3$

Reading Strategies

1. $4^2 = 16$; $\log_5 0.2 = -1$; $\log_8 1 = 0$

2. $\log_b 1 = 0$ is the same as $b^0 = 1$ and any number to the 0 power is 1.

3. $f^{-1}(x) = \log_4 x$

4. a. $g^{-1}(x) = \log_{\frac{1}{2}} x$

   b. Domain of $g(x)$: all real numbers; range of $g(x)$: $y > 0$; domain of $g^{-1}(x)$: $x > 0$; range of $g^{-1}(x)$: all real numbers.

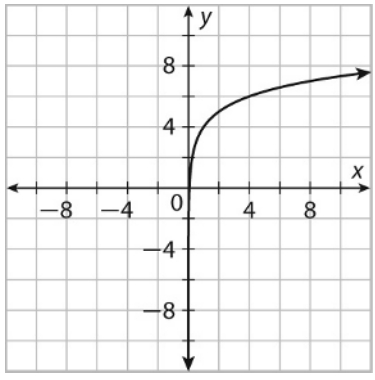
Success for English Learners

1. Exponential form has an exponent in it, and logarithmic form has a "log" in it.
2. Look at the number to the right and below "log." If there is no number there, the base is 10.
3. If $\log_b x = 0$, then x has to be 1.

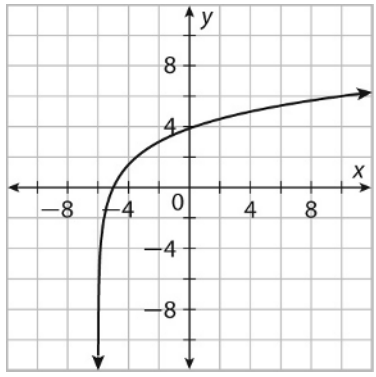
LESSON 15-2

Practice and Problem Solving: A/B

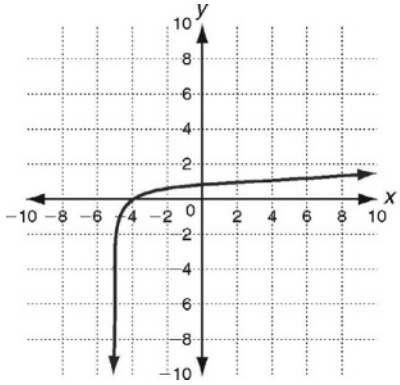
1. $x = 0$; Graph of $f(x) = \log_2 x$ translated 4 units up;



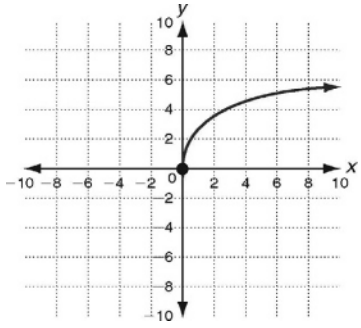
2. $x = -6$; Graph of $f(x) = \log_4 x$ stretched vertically by a factor of 3 and translated 6 units left



3. $x = -5$; Graph of $f(x) = \log x$ translated 5 units left;



4. $x = 0$; Graph of $f(x) = \ln x$ translated units up;



5. $g(x) = -\log(x+1) - 4$

6. $g(x) = \frac{2}{5}\log_8(x-3) + 11$

7. $t(A) = \frac{1}{r}\ln\left(\frac{A}{P}\right)$; The inverse gives the time it takes for an investment to reach a certain balance A.