

Homework: Logarithmic Functions - Key

In Problems 1-4, write each equation in its equivalent exponential form

1. $2^5 = 32$	2. $2^4 = x$
3. $5^7 = y$	4. $b^{-1} = 10$

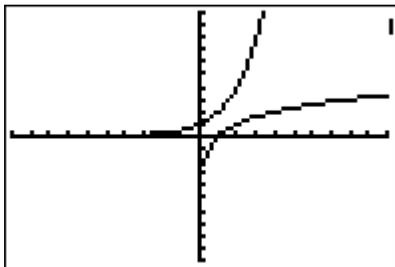
In Problems 5-10, write each equation in its equivalent logarithmic form

5. $\log_3 9 = 2$	6. $\log_3 \frac{1}{27} = -3$
7. $\log_{32} 2 = \frac{1}{5}$	8. $\log_7 x = 2$
9. $\log_b 100 = 5$	10. $\log_4 100 = y$

In Problems 11-21, evaluate each expression without using a calculator

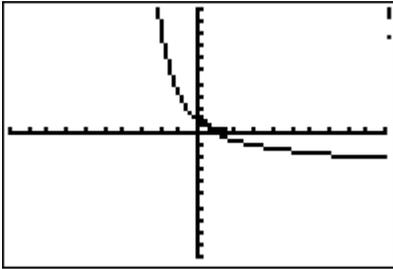
11. 3	12. 5
13. -2	14. -1
15. $\frac{1}{2}$	16. $\frac{-1}{5}$
17. $\frac{1}{2}$	18. 1
19. 0	20. 3
21. $3x$	

22. Graph $f(x) = \log_2 x$ and $g(x) = 2^x$ in the same rectangular coordinate system



Homework: Logarithmic Functions - Key

23. Graph $f(x) = \log_{1/3} x$ and $g(x) = \left(\frac{1}{3}\right)^x$ in the same rectangular coordinate system



In Problems 24-26, the graph of a logarithmic function is given. Select the function for each graph from the following options:

$$f(x) = \log_2 x \quad g(x) = \log_2(x+3) \quad h(x) = \log_2 x + 3$$

$$k(x) = -\log_2 x \quad j(x) = \log_2(-x) \quad m(x) = -\log_2(-x)$$

24. $j(x)$

25. $m(x)$

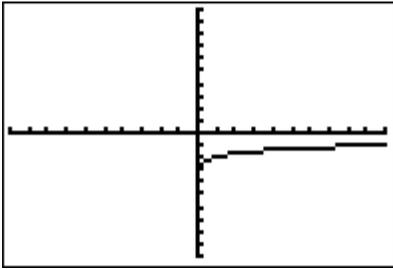
26. $g(x)$

In Problems 27-37, graph the function (use the change of base formula where necessary)

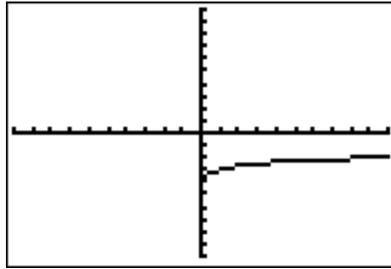
<p>27.</p>	<p>28.</p>
<p>29.</p>	<p>30.</p>

Homework: Logarithmic Functions - Key

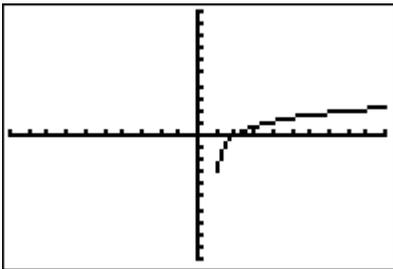
31.



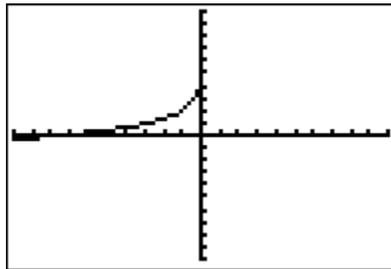
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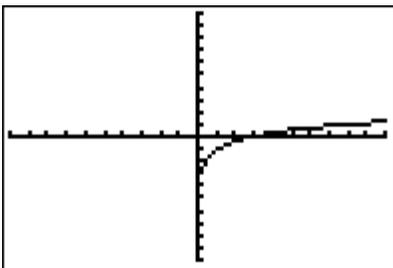
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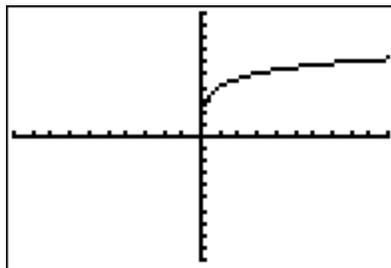
34.



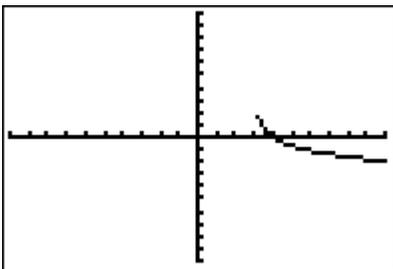
35.



36.



37.



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In Problems 38-40, find the domain of each logarithmic function

38. $x > \frac{2}{3}$	39. $x < 3$
40. $x \neq 4$	

In Problems 41-50, evaluate or simplify each expression without using a calculator

41. 5	42. -2
43. 45	44. 0
45. 8	46. -3
47. $3x - 1$	48. $7x$
49. $9x - 7$	50. 9