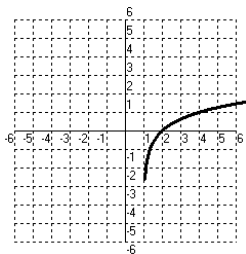
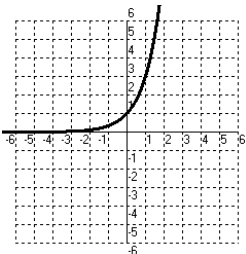
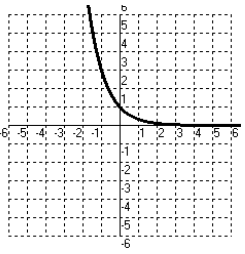
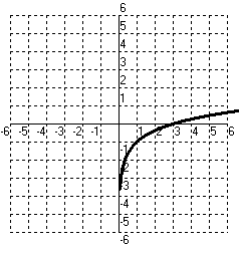
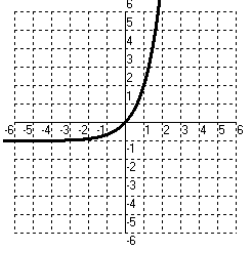
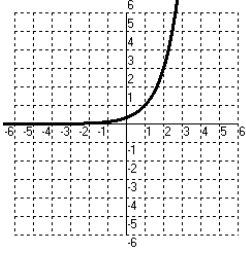
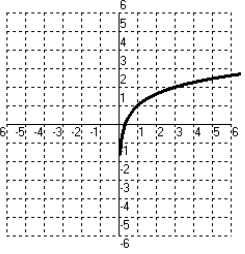


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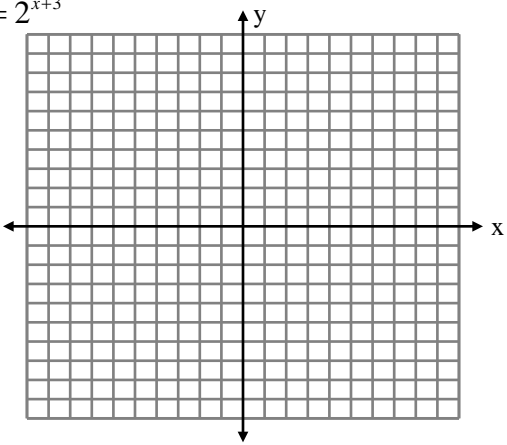
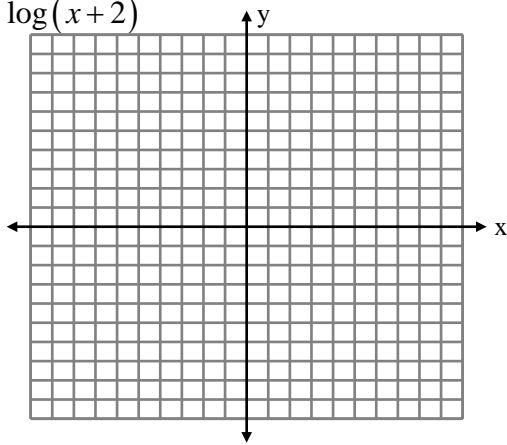
**I. Match each equation with its graph. DO THIS WITHOUT A GRAPHING CALCULATOR!**

1. $y = -3^{-x}$	<p><b>A.</b></p> 	<p><b>B.</b></p> 	<p><b>C.</b></p> 
2. $y = 3^x - 1$			
3. $y = \left(\frac{1}{3}\right)^x$			
4. $y = 3^{x-1}$			
5. $y = \log_3(x-1)$			
6. $y = \log_3 x + 1$			
<p><b>D.</b></p> 	<p><b>E.</b></p> 	<p><b>F.</b></p> 	<p><b>G.</b></p> 

**II. Evaluate to three decimal places.**

7. $\log \sqrt[4]{131} = x$	8. $\ln x = 3.5$	9. $\log x = -3$	10. $\log_{17} 5 = x$
11. $x = \ln 3$	12. $x = \log_6 50$	13. $\ln x = -2$	14. $\ln \sqrt{3}$

**III. Graph and fill in the chart for EACH function.**

<p>15. <math>f(x) = 2^{x+3}</math></p> <div style="text-align: center;">  </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">                 Domain: _____ Range: _____                  Equation of Asymptote: _____                  x-int: _____ y-int: _____             </div>	<p>16. <math>f(x) = \log(x+2)</math></p> <div style="text-align: center;">  </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">                 Domain: _____ Range: _____                  Equation of Asymptote: _____                  x-int: _____ y-int: _____             </div>
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IV. Expand each of the following logarithms.

17. $\log_5 \left( \frac{4x^2}{y^3} \right)$	18. $\ln \left( \frac{\sqrt{xy}}{5} \right)$	19. $\log(4x^2y)$
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V. Condense each of the following logarithmic expressions.

20. $\ln 3 - \ln x + 2 \ln y$	21. $\frac{1}{2} \log x - 3 \log y - \log z$	22. $\log_3 x + \frac{3}{2} \log_3 x + 2 \log_3 z$
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VI. Solve for the variable. Round to the nearest hundredth when necessary.

23. $\log_x 81 = 4$	24. $\log_2 x = 5$	25. $\ln(x+1) = 0$
26. $\log_8 5 + \frac{1}{2} \log_8 9 = \log_8 (2x+3)$	27. $\frac{1}{2} \log x - \log 100 = 2$	28. $\ln x = \ln 5 - 3 \ln 2 + \frac{1}{4} \ln 3$
29. $\log_7 x - \frac{1}{2} \log_7 4 = \frac{1}{2} \log_7 (2x-3)$	30. $\log 2 = \frac{1}{4} \log 16 - x$	31. $\log x + \log(x-15) = 2$