

**Evaluate the expression for the specified x value.**

1.  $\left(\frac{7}{2}\right)^x$  for  $x = 2$

2.  $\frac{1}{3} \cdot 6^x$  for  $x = 2$

3.  $\frac{1}{3}\left(\frac{1}{2}\right)^x$  for  $x = -2$

**Determine the base (b) and then circle whether the function represents exponential growth or exponential decay.**

4.  $y = \frac{1}{5} \cdot 14^x$

$A_0 =$  \_\_\_\_\_  $b =$  \_\_\_\_\_  
growth      decay

5.  $y = 8\left(\frac{1}{3}\right)^x$

$A_0 =$  \_\_\_\_\_  $b =$  \_\_\_\_\_  
growth      decay

6.  $y = \frac{1}{3} \cdot \left(\frac{5}{2}\right)^x$

$A_0 =$  \_\_\_\_\_  $b =$  \_\_\_\_\_  
growth      decay

**Determine if the equation or graph represents exponential growth or decay. Then determine the domain, range, and horizontal asymptote for each equation or graph given.**

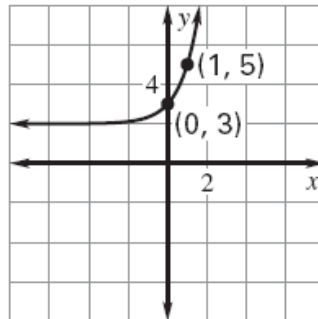
7.  $y = 2 \cdot 3^{x+1} + 2$

growth      decay

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

Horizontal Asymptote: \_\_\_\_\_

8.

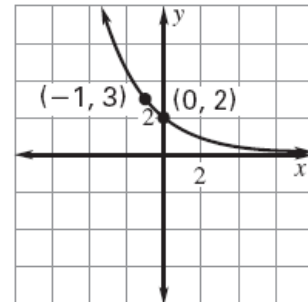


growth      decay

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

Horizontal Asymptote: \_\_\_\_\_

9.



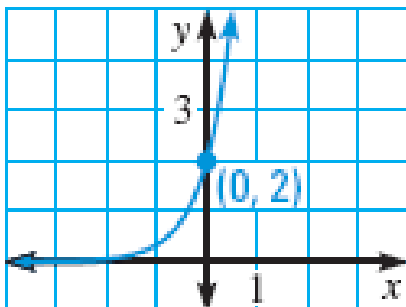
growth      decay

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

Horizontal Asymptote: \_\_\_\_\_

**Choose the best answer for each multiple choice question.**

10. Which function's graph is shown?



A.  $y = 6^x$

B.  $y = 2 \cdot 6^x$

C.  $y = \left(\frac{1}{6}\right)^x$

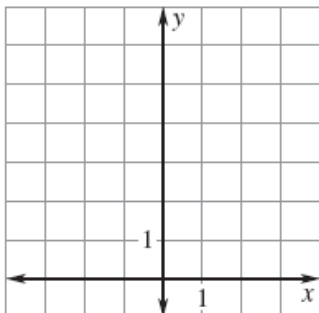
D.  $y = 2 \cdot \left(\frac{1}{6}\right)^x$

**Graph the following exponential growth and decay functions.**

12.  $y = (2)^x$

Domain \_\_\_\_\_ Range \_\_\_\_\_

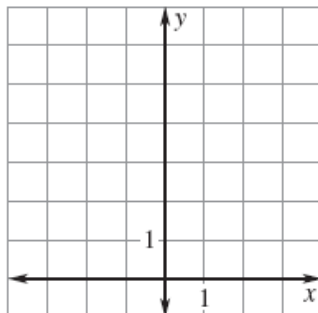
Horizontal Asymptote: \_\_\_\_\_(equation)



13.  $y = 2 \cdot (2)^x$

Domain \_\_\_\_\_ Range \_\_\_\_\_

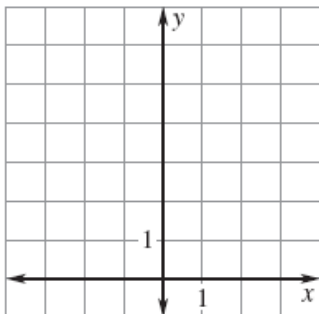
Horizontal Asymptote: \_\_\_\_\_(equation)



14.  $y = 2^x + 3$

Domain \_\_\_\_\_ Range \_\_\_\_\_

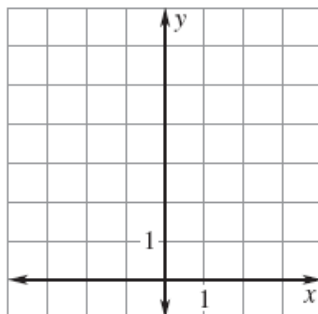
Horizontal Asymptote: \_\_\_\_\_(equation)



15.  $y = \left(\frac{1}{2}\right)^{x-1}$

Domain \_\_\_\_\_ Range \_\_\_\_\_

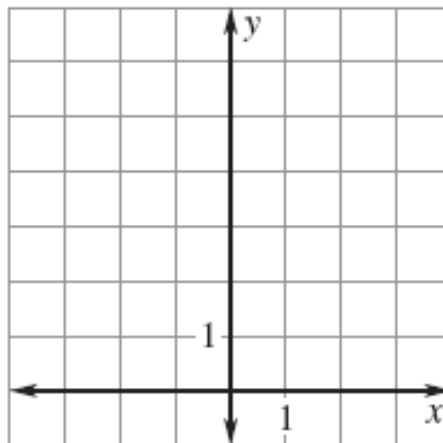
Horizontal Asymptote: \_\_\_\_\_(equation)



16.  $y = 2 \cdot \left(\frac{1}{2}\right)^x + 1$

Domain \_\_\_\_\_ Range \_\_\_\_\_

Horizontal Asymptote: \_\_\_\_\_



Use the following formulas to answer the word problems. Round your answer to the nearest hundredth.

$$T = P_0(1+r)^t \quad T = P_0(1-r)^t \quad T = P_0\left(1+\frac{r}{n}\right)^{nt} \quad T = P_0e^{rt}$$

Write an equation for each and then use it to find the specified amount. **YOU MUST SHOW ALL WORK FOR CREDIT!**  
The formulas will be given on the quiz/test but you need to know when to use each.

17. You buy a new stereo system for \$640. The value of the system decreases by 7% each year. What will the value of the stereo system be in 3 years?

18. You purchase real estate for \$85,000. Each year, the value of the real estate increases by 5%. How much will the real estate be worth in two years?

19. You deposit \$2200 into an account that pays 3% interest compounded continuously. How much will be in your account after 15 years?

20. You deposit \$2200 in an account that pays 5.5% annual interest. Find the balance after 6 years if the interest is compounded quarterly (4 times a year).

Write the equation in logarithmic form.

21.  $2^4 = 16$

22.  $15^0 = 1$

23.  $5^{-2} = \frac{1}{25}$

24.  $49^{\frac{1}{2}} = 7$

Write the equation in exponential form.

25.  $\log_4 16 = 2$

26.  $\log_{64} 4 = \frac{1}{3}$

27.  $\log_6 \frac{1}{36} = -2$

28.  $\log_{20} 1 = 0$

Evaluate each expression. (Set each expression equal to a variable and rewrite in exponential form to help!)

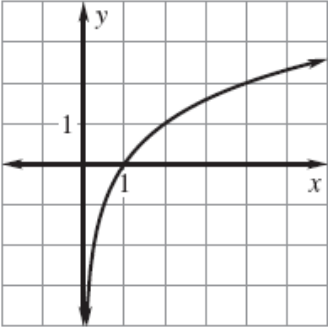
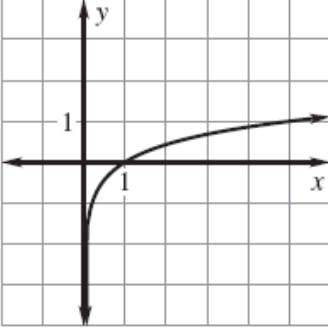
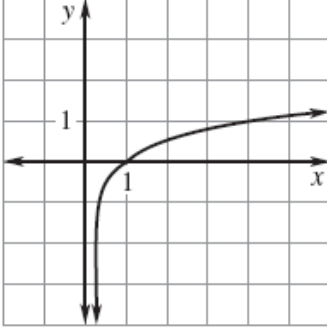
29.  $\log_3 243$

30.  $\log_5 \frac{1}{125}$

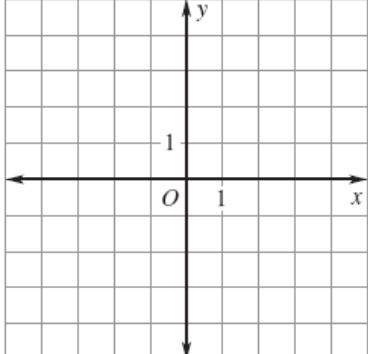
31.  $\log_{\frac{1}{4}} 256$

32. $\log_7 49$	33. $\log_3 1$	34. $\log_{\frac{1}{2}} 16$
35. $\log_{27} 3$	36. $\log_9 81$	37. $\log_3 \frac{1}{3}$
38. $\log_4 4^2$	39. $\log_6 6^4$	40. $\log_2 2^5$

**Match the following three log functions with the appropriate graph.**

41. $y = \log_5 x$	42. $y = \log_2 x$	43. $y = \log_4 x$
A. 	B. 	C. 

**Rewrite the log equation in exponential form. Graph the log function using the table. Determine the Vertical Asymptote, the Domain, and the Range.**

44. $y = \log_3 x$  Domain _____ Range _____ VERTICAL Asymptote: _____	
--	---

<p>45. <math>y = \log_2(x - 2)</math></p> <p>Domain _____</p> <p>Range _____</p> <p>VERTICAL Asymptote: _____</p>	
---	--

**Expand the expression. Assume all variables are positive.**

46. $\log_5 6x$	47. $\log_3 \frac{x}{4}$
48. $\log_2 x^3$	49. $\log 3x^4$

**Condense the expression. Assume all variables are positive.**

50. $\log_7 12 + \log_7 3$	51. $\log_7 12 - 2 \cdot \log_7 3$
52. $\log_7 5 + 3 \cdot \log_7 x$	53. $2 \cdot \log x - \log 4$

**Use  $\log_6 3 \approx 0.613$  and  $\log_6 8 \approx 1.161$  to find the value of the following to the nearest thousandth. You MUST SHOW WORK FOR FULL CREDIT!**

54. $\log_6 24$	55. $\log_6 \frac{8}{3}$
56. $\log_6 9$	57. $\log_6 72$

**Solve the following exponential equations. Check for any extraneous solutions. Round any decimals to the hundredth.**

58. $7^{3x+5} = 7^{11}$	59. $6^3 = 6^{2x+5}$
60. $8^{4x-9} = 8^x$	61. $7^x = 31$

62.  $5^x = 80$

63.  $3^{x-7} = 50$

**Solve the following logarithmic equations. Check for any extraneous solutions. Round any decimals to the hundredth.**

64.  $\log_6(5x - 2) = \log_6(2x + 7)$

65.  $\log_4(2x + 3) = \log_4(x - 5)$

66.  $\log_3(4x + 1) = 4$

67.  $\log_7(2x - 3) = 2$

68.  $\log_6(x) + \log_6(x + 1) = 1$

69.  $\log_2(2x) + \log_2(x + 2) = 4$