

Review – Test Chapter 7 - **No Calculator on this part!****Rewrite the expression in exponential form:**

1.  $\log_4 64 = 3$

2.  $\log_2 32 = 5$

3.  $\log_4 1 = 0$

4.  $\log_{\frac{1}{2}} 8 = -3$

5.  $\log_{\frac{1}{4}} 16 = -2$

6.  $\log_{\frac{1}{3}} 27 = -3$

7.  $\log_{32} 2 = \frac{1}{5}$

8.  $\log_{16} 4 = \frac{1}{2}$

9.  $\log_{125} 5 = \frac{1}{3}$

**Evaluate the expression:**

10.  $\log_5 25$

11.  $\log_3 27$

12.  $\log_2 16$

13.  $\log_{64} 4$

14.  $\log_5 1$

15.  $\log_{25} 5$

16.  $\log_{\frac{1}{2}} 16$

17.  $\log_{\frac{1}{6}} 36$

18.  $\log_{\frac{1}{3}} 27$

19.  $\log_3 3^x$

20.  $\log_2 32^x$

21.  $\log 1000^x$

**Find the inverse of the function:**

22.  $y = \log_7 x$

23.  $y = \log_5 (x - 4)$

24.  $y = \log(x + 2)$

25.  $y = \log_5 3x$

26.  $y = \log_{\frac{1}{2}} x$

27.  $y = \log_{\frac{1}{4}} 2x$

**Use the properties of logarithms to expand:**

28.  $\log_3 \frac{5}{6}$

29.  $\log_4 x^2 y^3$

30.  $\log_5 xyz$

31.  $\log_2 \frac{x^2}{yz}$

32.  $\log \frac{xy^3}{z}$

33.  $\log_5 \frac{m^2}{n}$

**Use the properties of logarithms to condense:**

34.  $\log_2 3 + \log_2 x$

35.  $\log_3 4 + 2\log_3 x$

36.  $\log_4 x + \log_4 y + 3\log_4 z$

37.  $\log_2 x - \log_2 7$

38.  $2\log_5 x - \log_5 y$

39.  $2\log x + \log y - 3\log z$

**Solve:**

40.  $\log(x+9) = \log(2x+5)$

41.  $\log_3(5x-1) = 2$

42.  $\log x + \log(x-15) = 2$

43.  $\log_4(3x+5) = \log_4(5x-9)$

44.  $\log_{\frac{1}{2}}(6x+2) = -5$

45.  $2\log_5 x - \log_5 4 = 2$

46.  $\ln(7x-4) = \ln(2x+11)$

47.  $\log 5x + \log(x-1) = 2$

48.  $\log_2(x-6) = 5$

49.  $\log_4(x+12) + \log_4 x = 3$

50.  $7^{x+5} = 49^{2x+1}$

51.  $5^{x-4} = 25^{x-6}$

52.  $8^{3x-1} = 16^{2x+3}$

53.  $\log_3(7x-1) = 3$

**You may use a calculator on this part!**

**Use  $\log 2 \approx 0.301$  and  $\log 5 \approx 0.699$  to evaluate:**

54.  $\log \frac{2}{5}$

55.  $\log 8$

56.  $\log 25$

**Use  $\log 5 \approx 0.699$  and  $\log 8 \approx 0.903$  to evaluate:**

57.  $\log \frac{5}{8}$

58.  $\log 40$

59.  $\log 64$

**Use the change-of-base formula to evaluate (Round to three decimal places.):**

60.  $\log_3 7$

61.  $\log_8 5$

62.  $\log_6 11$

63.  $\log_4 31$

64.  $\log_5 19$

65.  $\log_{13} 6$

66. The value of a television has been decreasing by 18% each year since it was new. After 5 years, the value is \$550. Find the original cost of the television. Hint: Exponential Decay can be modeled by the equation:  $y = a(1 - r)^t$ .

67. You deposit \$3500 in an account that pays 4% annual interest. Find the balance after 7 years if the interest is compounded monthly. Hint: Compound Interest can be modeled by the equation:

$$A = P \left( 1 + \frac{r}{n} \right)^{nt} .$$

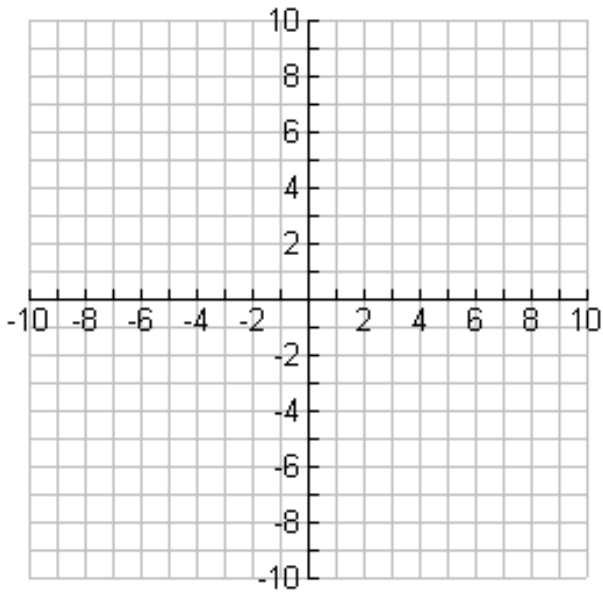
68. In 2002, the average price of a concert ticket for Super Grouper was \$72. Ticket prices increased an average of 3% each year. How much did a ticket cost after 3 years? Hint: Exponential growth can be modeled by the equation:  $y = a(1 + r)^t$ .

69. Harry invested \$5000 at 5% interest compounded quarterly. How much will the investment be worth after 5 years. Hint: Compound Interest can be modeled by the equation:

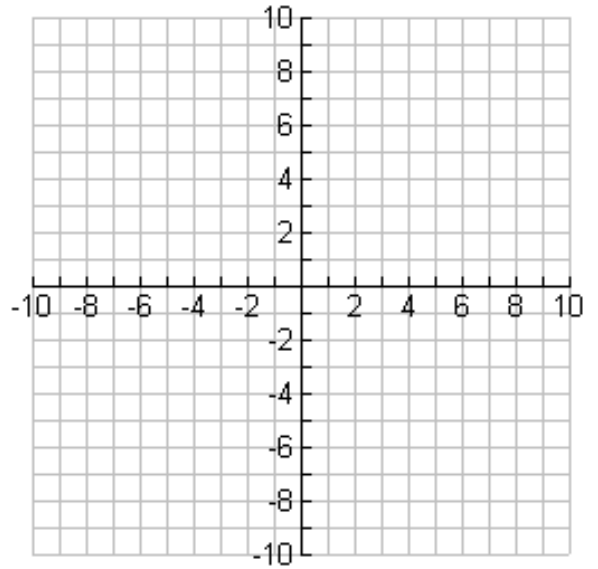
$$A = P \left( 1 + \frac{r}{n} \right)^{nt} .$$

70. A quantity of insulin used to regulate sugar in the bloodstream breaks down by about 5% each minute. If a person takes a dose of 10 units of insulin, how much remains after 10 minutes? Hint: Exponential Decay can be modeled by the equation:  $y = a(1 - r)^t$ . Round to three decimal places.

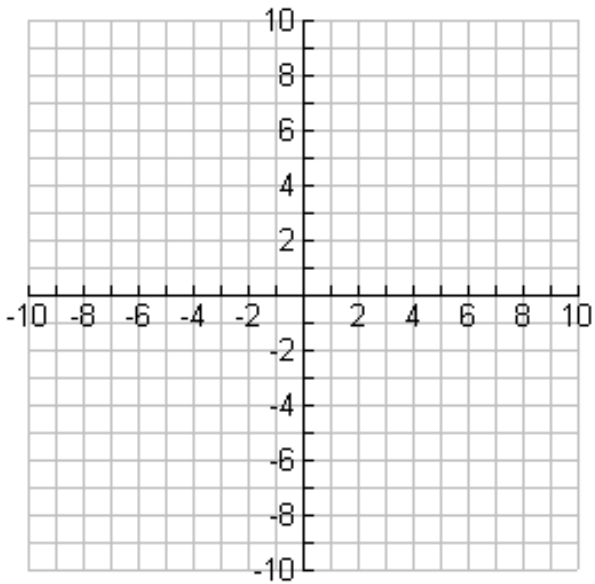
71. Graph:  $y = 3^{x-2} - 1$



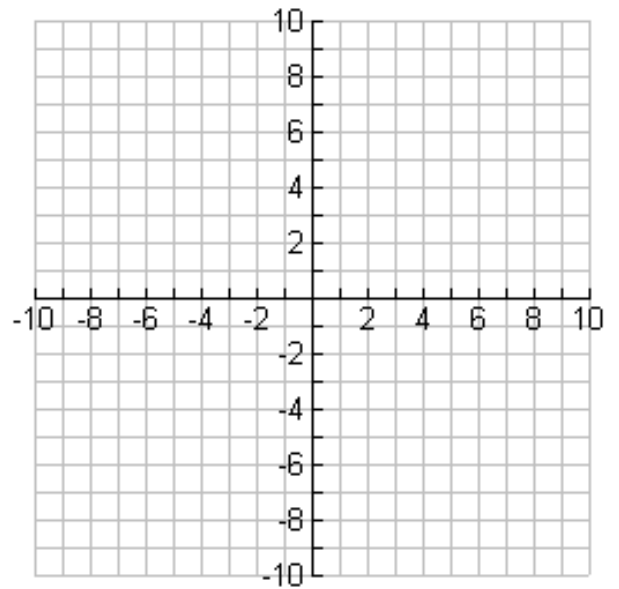
72. Graph:  $y = 3^{x-2} + 2$



73.  $y = \left(\frac{2}{3}\right)^{x-1} + 5$



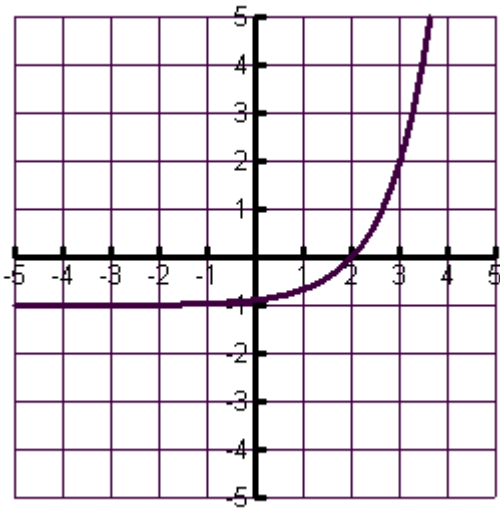
74.  $y = 2\left(\frac{1}{3}\right)^{x+2} - 3$



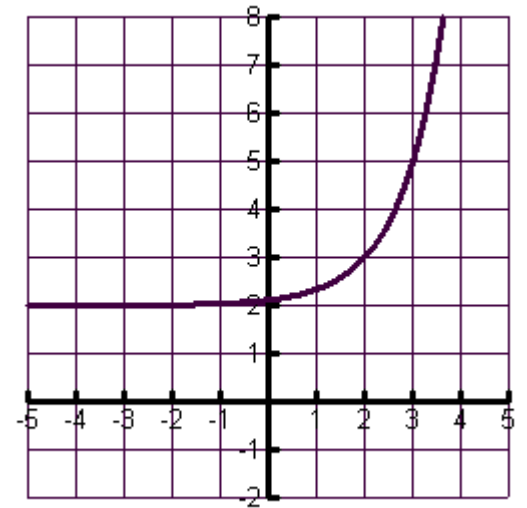
## Review Chapter 7 Answers

1. $4^3 = 64$	2. $2^5 = 32$	3. $4^0 = 1$
4. $\frac{1^{-3}}{2} = 8$	5. $\frac{1^{-2}}{4} = 16$	6. $\frac{1^{-3}}{3} = 27$
7. $32^{\frac{1}{5}} = 2$	8. $16^{\frac{1}{2}} = 4$	9. $125^{\frac{1}{3}} = 5$
10. $x = 2$	11. $x = 3$	12. $x = 4$
13. $x = \frac{1}{3}$	14. $x = 0$	15. $x = \frac{1}{2}$
16. $x = -4$	17. $x = -2$	18. $x = -3$
19. $x$	20. $5x$	21. $3x$
22. $y = 7^x$	23. $y = 5^x + 4$	24. $y = 10^x - 2$
25. skip	26. $y = \frac{1^x}{2}$	27. skip
28. $\log_3 5 - \log_3 6$	29. $2\log_4 x + 3\log_4 y$	30. $\log_5 x + \log_5 y + \log_2 z$
31. $2\log_2 x - (\log_2 y + \log_2 z)$	32. $\log x + 3\log y - \log z$	33. $2\log_5 m - \log_5 n$
34. $\log_2 3x$	35. $\log_3 4x^2$	36. $\log_4 xyz^3$
37. $\log_2 \frac{x}{7}$	38. $\log_5 \frac{x^2}{y}$	39. $\log \frac{x^2 y}{z^3}$
40. $x = 4$	41. $x = 2$	42. $x = 20$
43. $x = 7$	44. $x = 5$	45. $x = 10$
46. $x = 3$	47. $x = 5$	48. $x = 1$
49. $x = 4$	50. $x = 1$	51. $x = 8$
52. $x = 15$	53. $x = 4$	54. $-0.398$
55. 0.903	56. 1.398	57. $-0.2041$
58. 1.602	59. 1.806	60. 1.771
61. 0.774	62. 1.338	63. 2.477
64. 1.830	65. 0.699	66. \$1483.52
67. \$4628.80	68. \$78.68	69. \$6410.19
70. 5.987 units		

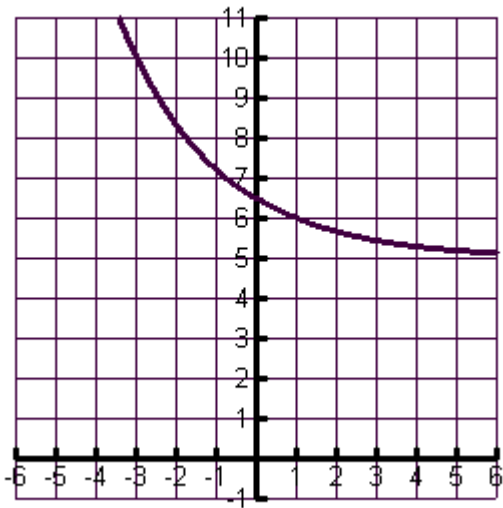
71.



72.



73.



74.

