

exponential decay, and give the y -intercept. (EXAMPLE 1)

5. $f(x) = \left(\frac{1}{2}\right)^x$

6. $g(x) = 3(2)^x$

7. $k(x) = 5(0.5)^x$

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8. **INVESTMENTS** Find the final amount of a \$250 investment after 5 years at 6% interest compounded annually, quarterly, and daily. (EXAMPLE 2)

9. **INVESTMENTS** Find the effective yield for a \$2000 investment that is worth \$4000 after 15 years. (EXAMPLE 3)

Practice and Apply

Identify each function as linear, quadratic, or exponential.

10. $g(x) = 10x + 3$

11. $k(x) = (77 - x)x$

12. $f(x) = 12(2.5)^x$

13. $k(x) = 0.5^x - 3.5$

14. $g(x) = (2200)^{3.5x}$

15. $h(x) = 0.5x^2 + 7.5$

Tell whether each function represents exponential growth or decay.

16. $y(x) = 12(2.5)^x$

17. $k(x) = 500(1.5)^x$

18. $y(t) = 45\left(\frac{1}{4}\right)^t$

19. $d(x) = 0.125\left(\frac{1}{2}\right)^x$

20. $g(x) = 0.25(0.8)^x$

21. $s(k) = 0.5(0.5)^k$

22. $m(x) = 222(0.9)^x$

23. $f(k) = 722^{-k}$

24. $g(x) = 0.5(787)^{-x}$

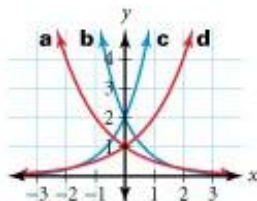
Match each function with its graph.

25. $y = 2^x$

26. $y = 2(3)^x$

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

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



Find the final amount for each investment.

29. \$1000 at 6% interest compounded annually for 20 years

30. \$1000 at 6% interest compounded semiannually for 20 years

31. \$750 at 10% interest compounded quarterly for 10 years

32. \$750 at 5% interest compounded quarterly for 10 years

33. \$1800 at 5.65% interest compounded daily for 3 years

34. \$1800 at 5.65% interest compounded daily for 6 years

35. Graph $f(x) = 2^x$, $g(x) = 5^x$, and $h(x) = 8^x$.

- Which function exhibits the fastest growth? the slowest growth?
- What is the y -intercept of each function?
- State the domain and range of each function.

36. Graph $a(x) = \left(\frac{1}{2}\right)^x$, $b(x) = \left(\frac{1}{5}\right)^x$, and $c(x) = \left(\frac{1}{8}\right)^x$.

- Which function exhibits the fastest decay? the slowest decay?
- What is the y -intercept of each function?
- State the domain and range of each function.

TRANSFORMATIONS Graph each pair of functions and describe the transformations from f to g .

38. $f(x) = \left(\frac{1}{2}\right)^x$ and $g(x) = 5\left(\frac{1}{2}\right)^x$

40. $f(x) = 2^x$ and $g(x) = 3(2)^x + 1$

42. $f(x) = 10^x$ and $g(x) = 3(10)^{x+2}$

44. $f(x) = 3\left(\frac{1}{2}\right)^x$ and $g(x) = 3(2^x)$

39. $f(x) = \left(\frac{1}{10}\right)^x$ and $g(x) = 0.5\left(\frac{1}{10}\right)^x$

41. $f(x) = 10^x$ and $g(x) = 2(10)^x - 3$

43. $f(x) = 2^x$ and $g(x) = 5(2)^{x-1}$

45. $f(x) = \left(\frac{1}{3}\right)^x$ and $g(x) = 2(3)^{-x}$

TRANSFORMATIONS Describe how each transformation of $f(x) = b^x$ affects the domain and range, the asymptotes, and the intercepts.

- a. a vertical stretch
- b. a vertical compression
- c. a horizontal translation
- d. a vertical translation
- e. a reflection across the y -axis

STATISTICS Use an exponential regression equation to find the effective yield for each investment. Assume that interest is compounded only once each year.

47. a \$1000 mutual fund investment made at the beginning of 1990 that is worth \$1450 at the beginning of 2000

48. a house that is bought for \$75,000 at the end of 1995 and that is worth \$95,000 at the end of 2005

STATISTICS Use an exponential regression equation to model the annual rate of inflation, or percent increase in price, for each item described.

49. a half-gallon of milk cost \$1.37 in 1989 and \$1.48 in 1995 [Source: U.S. Bureau of Labor Statistics]

50. a gallon of regular unleaded gasoline cost \$0.93 in 1986 and \$1.11 in 1993 [Source: U.S. Bureau of Labor Statistics]

51. **INVESTMENTS** Find the final amount of a \$2000 certificate of deposit (CD) after 5 years at an annual interest rate of 5.51% compounded annually.

52. **INVESTMENTS** Consider a \$1000 investment that is compounded annually at three different interest rates: 5%, 5.5%, and 6%.

- a. Write and graph a function for each interest rate over a time period from 0 to 60 years.
- b. Compare the graphs of the three functions.
- c. Compare the shapes of the graphs for the first 10 years with the shapes of the graphs between 50 and 60 years.

53. **INVESTMENTS** The final amount for \$5000 invested for 25 years at 10% annual interest compounded semiannually is \$57,337.

- a. What is the effect of doubling the amount invested?

