

7-6

Practice B

Form K

Exponential Functions

Determine whether each table represents a linear or an exponential function. Explain. Remember that an exponential function exists when you have a constant ratio between the y values and a constant difference between the x values.

1.

x	1	2	3	4	5	6
y	2	4	8	16	32	64

2.

x	1	2	3	4	5	6
y	1	4	7	10	13	16

Determine whether each equation represents a linear or an exponential function. Remember, an exponential function takes the form $y = a \cdot b^x$ where $a \neq 0$ and $b > 0, b \neq 1$.

3. $y = 3 \cdot 2^x$

4. $y = 4 \cdot \left(\frac{1}{5}\right)^x$

5. $y = 5x - 8$

6. $y = 5 \cdot 1.07^x$

Evaluate each function for the given value.

7. $y = 4^x$ for $x = 3$

8. $f(x) = 2 \cdot 3^x$ for $x = 5$

9. $h(t) = 60 \cdot 1.07^t$ for $t = 8$

10. $y = 5 \cdot 7^x$ for $x = 0$

11. What is the solution or solutions of $2^x = 7$?

12. An investment of \$2000 in a bank account doubles every 5 years. The function that models the growth of this investment is $f(x) = 2000 \cdot 2^x$, where x is the number of doubling periods. How much will the investment be worth after two doubling periods, or 10 years?
13. The city library will be increasing the number of books it has to loan at a rate of 5% per year. The library currently has 40,000 books. The number of books they will have in any given year is modeled by the function $h(t) = 40,000 \cdot 1.05^t$, where t is the number of years. How many books will the library have 8 years from now?

Graph each exponential function.

14. $y = 2^x$

15. $y = 3 \cdot 2^x$

16. $y = 5^x$

17. $y = 3 \cdot 5^x$

18. **Writing** Discuss the similarities and differences between the four graphs that you sketched in Exercises 13–16.

Solve each equation.

19. $2^x = 16$

20. $10 \cdot 3^x = 90$

21. $5^x - 4 = 21$

22. $4^x + 6 = 70$