

Practice

Form G

Exponential Growth and Decay

Identify the initial amount a and the growth factor b in each exponential function.

1. $f(x) = 3 \cdot 5^x$

2. $y = 250 \cdot 1.065^x$

3. $g(t) = 3.5^t$

4. $h(x) = 5 \cdot 1.02^x$

Find the balance in each account after the given period.

5. \$8000 principal earning 5% compounded annually, after 6 yr
6. \$2000 principal earning 5.4% compounded annually, after 4 yr
7. \$500 principal earning 4% compounded quarterly, after 10 yr
8. \$6500 principal earning 2.8% compounded monthly, after 2 yr

Identify the initial amount a and the decay factor b in each exponential function.

9. $y = 8 \cdot 0.8^x$

10. $f(x) = 12 \cdot 0.1^x$

State whether the equation represents *exponential growth*, *exponential decay*, or *neither*.

11. $y = 0.82 \cdot 3^x$

12. $f(x) = 5 \cdot 0.3^x$

13. $f(x) = 18 \cdot x^2$

14. $y = 0.9^x$

15. The town manager reports that revenue for a given year is \$2.5 million. The budget director predicts that revenue will increase by 4% per yr. If the director's prediction holds true, how much revenue will the town have available 10 years from the date of the town manager's report? Write an expression to represent the equivalent monthly increase in revenue.
16. A wildlife manager determines that there are approximately 200 deer in a certain state park.
 - a. The population is growing at a rate of 7% per year. How many deer will live in the park after 4 years?
 - b. If the carrying capacity of this park is 350 deer, how long will it take for the deer population to reach carrying capacity?

Practice (continued)

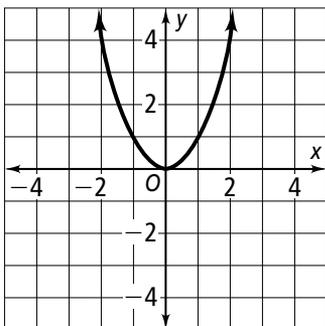
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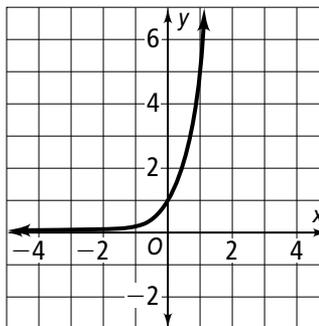
- 17. Open-Ended** Write an exponential function that begins its rapid increase when $2 \leq x \leq 3$. Write another that begins its rapid increase when $3 \leq x \leq 4$. Write a third that begins its rapid increase when $6 \leq x \leq 8$.
- 18.** A business purchases a computer system for \$3000. If the value of the system decreases at a rate of 15% per year, how much is the computer worth after 4 years?
- 19. Writing** Explain the difference in how you would model the following situations. Person A puts \$1000 in a safe in his home, and puts in an additional \$50 per year. Person B puts \$1000 in an investment that earns 5% per year. Why is one exponential and the other linear? How would their graphs compare? How would their values compare over time?

State whether each graph shows an *exponential growth function*, an *exponential decay function*, or *neither*.

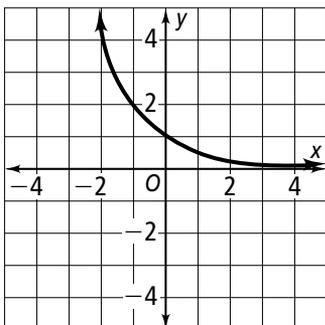
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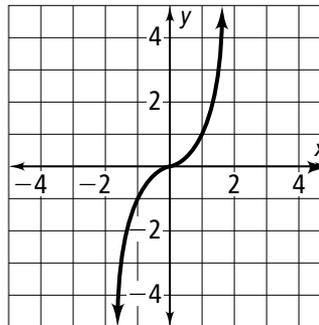
21.



22.



23.



- 24. Reasoning** Can the graph of an exponential function ever have a y-intercept of 0? Why or why not?