

LESSON
10-2

Exponential Growth and Decay

Practice and Problem Solving: A/B

Write an exponential growth function to model each situation. Then find the value of the function after the given amount of time.

1. Annual sales for a fast food restaurant are \$650,000 and are increasing at a rate of 4% per year; 5 years

2. The population of a school is 800 students and is increasing at a rate of 2% per year; 6 years

3. During a certain period of time, about 70 northern sea otters had an annual growth rate of 18%; 4 years

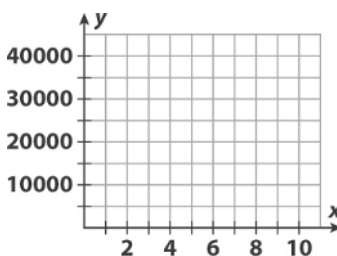
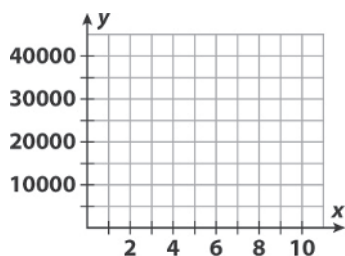
Write an exponential decay function to model each situation. Then find the value of the function after the given amount of time.

4. The population of a town is 2500 and is decreasing at a rate of 3% per year; 5 years

5. The value of a company's equipment is \$25,000 and decreases at a rate of 15% per year; 8 years

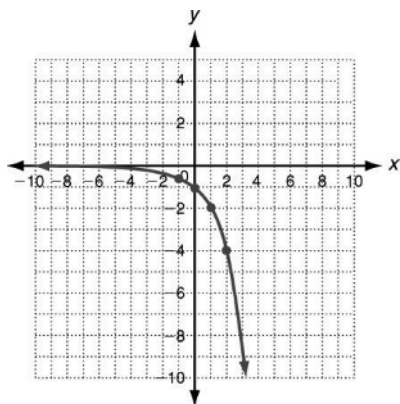
Write an exponential growth or decay function to model each situation. Then graph each function.

6. The population is 20,000 now and expected to grow at an annual rate of 5%.
7. A boat that cost \$45,000 is depreciating at a rate of 20% per year.



3.

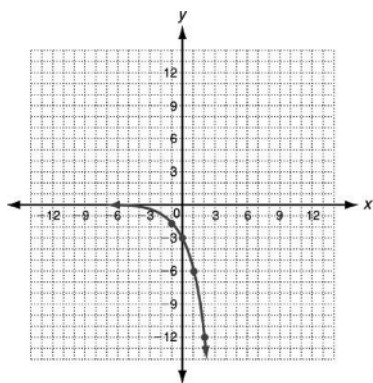
x	$y = -1(2)^x$	y
-1	$y = -1(2)^{-1}$	-0.5
0	$y = -1(2)^0$	-1
1	$y = -1(2)^1$	-2
2	$y = -1(2)^2$	-4



Reading Strategies

1. always
2. sometimes
3. always
4. never
- 5.

x	y
-1	$-\frac{3}{2}$
0	-3
1	-6
2	-12



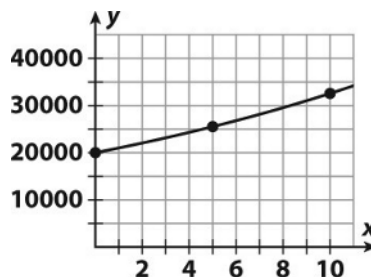
Success for English Learners

1. There would be 54 insects.
2. The graph of each function has the same general shape.

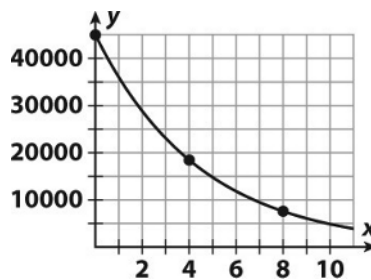
LESSON 10-2

Practice and Problem Solving: A/B

1. $y = 650,000(1.04)^x$; sales $\approx \$790,824.39$
2. $y = 800(1.02)^x$; population ≈ 901
3. $y = 70(1.18)^x$; population ≈ 136
4. $y = 2,500(0.97)^x$; population $\approx 2,147$
5. $y = 25,000(0.85)^x$; value $\approx \$6,812.26$
6. $y = 20,000(1.05)^x$



7. $y = 45,000(0.8)^x$



Practice and Problem Solving: C

1. $v_1(t) = 10,000(1.04)^t$;
 $v_2(t) = 8000(1.06)^t$
2. $v_1(5) = \$12,166.53$; $v_2(5) = \$10,705.80$;
the difference is less because the smaller investment is growing at twice the interest rate.
3. Yes, the value of Investment 2 will exceed the value of Investment 1 by the end of Year 12. At that point,
 $v_2(12) = \$16,097.57$ and
 $v_1(12) = \$16,010.32$.
4. Odette would earn more. For example, at the end of 1 year, Investment 1 is worth \$10,400 using annual compounding and \$10,408.08 using daily compounding.