

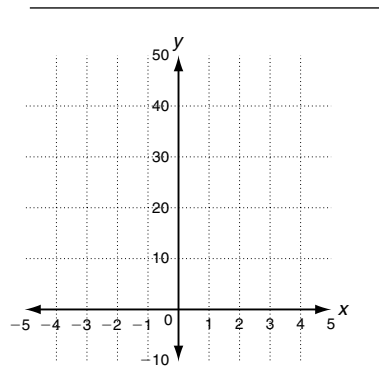
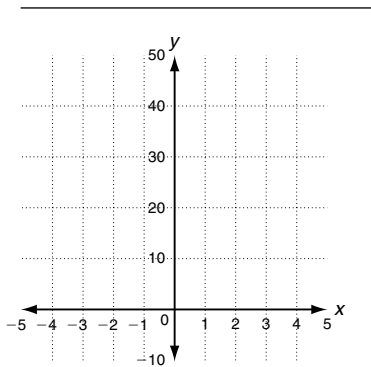
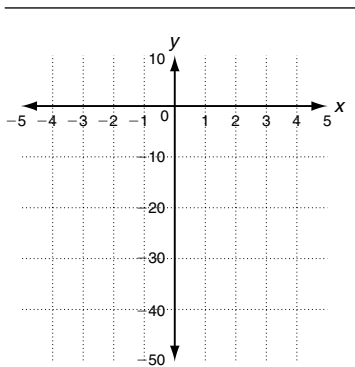
LESSON **7-1** **Practice C**
Exponential Functions, Growth, and Decay

Tell whether the function shows growth or decay. Then graph.

1. $j(x) = -3(0.04)^x$

2. $k(x) = 5(1.4)^x$

3. $p(x) = 0.25(6)^x$



Tell whether the function is an exponential function. Write *yes* or *no*.

4. $f(x) = -2x^5 - 9$

5. $g(x) = -0.2(5)^x$

6. $h(x) = 10(2.2)^x$

Solve.

7. Colleen's station wagon is depreciating at a rate of 9% per year. She paid \$24,500 for it in 2002. What will the car be worth in 2008 to the nearest hundred dollars?

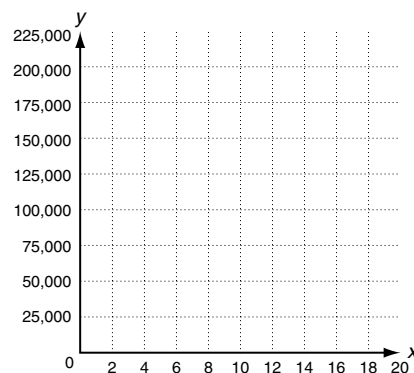
8. Kyle estimates that his business is growing at a rate of 5% per year. His profits in 2005 were \$67,000. Estimate his profits for 2010 to the nearest hundred dollars.

9. A parcel of land Jason bought in 2000 for \$100,000 is appreciating in value at a rate of about 4% each year.

a. Write a function to model the appreciation of the value of the land.

b. Graph the function.

c. In what year will the land double its value?



LESSON 7-1 Practice A
Exponential Functions, Growth, and Decay

Complete each statement.

- A function of the form $f(x) = ab^x$ is called an exponential function when b is greater than 1.
- A function of the form $f(x) = ab^x$ is called an exponential function when b is a number between 0 and 1.

Tell whether the function shows growth or decay. Then graph.

3. $f(x) = 3(2.5)^x$

a. Find the value of the base.

2.5

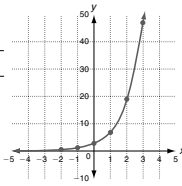
b. Does the function show growth or decay?

Growth

c. Make a table of values for the function.

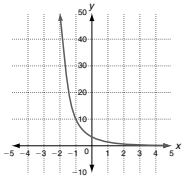
x	-2	-1	0	1	2	3
f(x)	0.48	1.2	3	7.5	18.75	46.875

d. Graph the function.



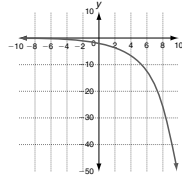
4. $g(x) = 2(0.2)^x$

Decay



5. $j(x) = -(1.5)^x$

Growth



Solve.

6. Some real estate agents estimate that the value of a house could increase about 4% each year.

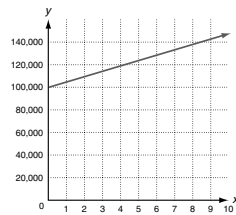
a. Write a function to model the growth in value for a house valued at \$100,000.

$y = 100,000(1.04)^x$

b. Graph the function.

c. A house is valued at \$100,000 in 2005. Predict the year its value will be at least \$130,000.

2012



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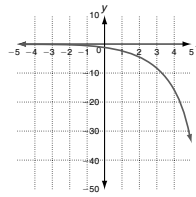
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LESSON 7-1 Practice B
Exponential Functions, Growth, and Decay

Tell whether the function shows growth or decay. Then graph.

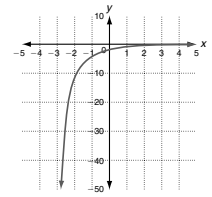
1. $g(x) = -(2)^x$

Growth



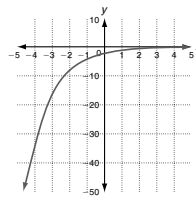
2. $h(x) = -0.5(0.2)^x$

Decay



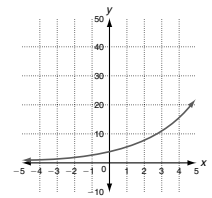
3. $j(x) = -2(0.5)^x$

Decay



4. $p(x) = 4(1.4)^x$

Growth



Solve.

5. A certain car depreciates about 15% each year.

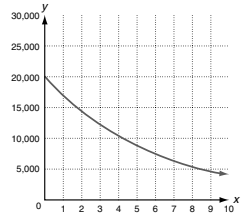
a. Write a function to model the depreciation in value for a car valued at \$20,000.

$y = 20,000(0.85)^x$

b. Graph the function.

c. Suppose the car was worth \$20,000 in 2005. What is the first year that the value of this car will be worth less than half of that value?

2010



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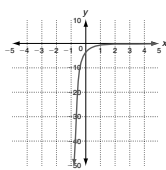
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LESSON 7-1 Practice C
Exponential Functions, Growth, and Decay

Tell whether the function shows growth or decay. Then graph.

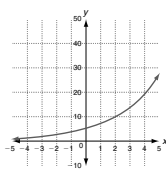
1. $j(x) = -3(0.04)^x$

Decay



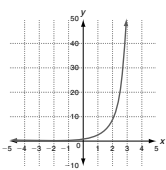
2. $k(x) = 5(1.4)^x$

Growth



3. $p(x) = 0.25(6)^x$

Growth



Tell whether the function is an exponential function. Write yes or no.

4. $f(x) = -2x^5 - 9$

No

5. $g(x) = -0.2(5)^x$

Yes

6. $h(x) = 10(2.2)^x$

Yes

Solve.

7. Colleen's station wagon is depreciating at a rate of 9% per year. She paid \$24,500 for it in 2002. What will the car be worth in 2008 to the nearest hundred dollars?

\$13,900

8. Kyle estimates that his business is growing at a rate of 5% per year. His profits in 2005 were \$67,000. Estimate his profits for 2010 to the nearest hundred dollars.

\$85,500

9. A parcel of land Jason bought in 2000 for \$100,000 is appreciating in value at a rate of about 4% each year.

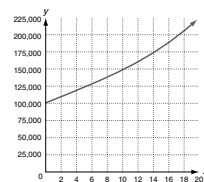
a. Write a function to model the appreciation of the value of the land.

$y = 100,000(1.04)^x$

b. Graph the function.

c. In what year will the land double its value?

2018



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LESSON 7-1 Reteach
Exponential Functions, Growth, and Decay

The base of an exponential function indicates whether the function shows growth or decay.

Exponential function: $f(x) = ab^x$

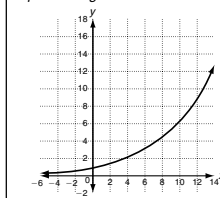
- a is a constant
- b is the base. The base is a constant.
 - If $0 < b < 1$, the function shows decay.
 - If $b > 1$, the function shows growth.
- x is an exponent.

$f(x) = 1.2^x$

$a = 1$

$b = 1.2$

$b > 1$, so the function shows exponential growth.

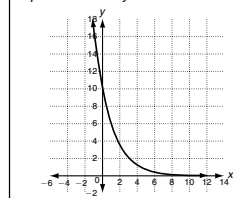


$g(x) = 10(0.6^x)$

$a = 10$

$b = 0.6$

$0 < b < 1$, so the function shows exponential decay.



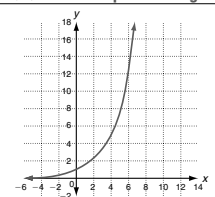
Tell whether each function shows growth or decay. Then graph.

1. $h(x) = 0.8(1.6^x)$

$a = 0.8$

$b = 1.6$

$h(x)$ shows exponential growth.

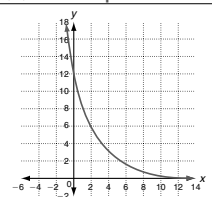


2. $p(x) = 12(0.7^x)$

$a = 12$

$b = 0.7$

$p(x)$ shows exponential decay.



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