

Modeling Data

For each set of data below:

- Which model, linear, quadratic, exponential, or logarithmic best fits the data based on the patterns of change?
- Write the function that best fits the data.
- Evaluate the function at the value given.

1.

x	1	2	3	4	5
$f(x)$	3	9	27	81	243

- model: _____
- function: _____
- $f(7) =$ _____

2.

x	1	2	3	4	5
$f(x)$	3	6	9	12	15

- model: _____
- function: _____
- $f(9) =$ _____

3.

x	1	2	3	4	5
$f(x)$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{32}$

- model: _____
- function: _____
- $f(8) =$ _____

4.

x	1	2	3	4	5
$f(x)$	1	4	9	16	25

a. model: _____

b. function: _____

c. $f(10) =$ _____

5.

x	4	16	64	256	1024
$f(x)$	1	2	3	4	5

a. model: _____

b. function: _____

c. $f(4096) =$ _____

6.

x	1	2	3	4	5
$f(x)$	10	20	40	80	160

a. model: _____

b. function: _____

c. $f(10) =$ _____

7.

x	5	25	125	625	3125
$f(x)$	1	2	3	4	5

a. model: _____

b. function: _____

c. $f(15625) =$ _____

8. The number of bacteria in a culture is a function of the number of hours represented in the table below.

Hours (x)	1	2	3	4	5
Bacteria (y)	80	155	320	650	1310

- a. Write an exponential regression equation that models the data.
- b. According to the model, how many bacteria will there be after 7 hours?
9. The spending for health services and supplies in the United States beginning in 1970 are shown in the table below.

Year (year 0: 1970) (x)	0	5	10	15	20
Spending (billions of dollars) (y)	69.1	124.7	238.9	407.2	652.4

- a. Write an exponential regression equation that models the data.
- b. According to the model, what was the spending in 1995?
10. The table below shows the number of applications for United States citizenship beginning in 1990.

Year (Year 0:1990 (x)	0	1	2	3	4	5
Applications (in thousands) (y)	234	206	342	522	543	1021

- a. Write an exponential regression equation that models the data.
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8.

x	2	4	6	8	10
$f(x)$	12	48	192	768	3072

- a. model: _____
- b. function: _____
- c. $f(11) =$ _____

9.

x	2	4	8	16
$f(x)$	2	4	6	8

- a. model: _____
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- c. $f(64) =$ _____

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Name _____

Unit 6 Holt Resource
p. 26, Algebra 2
p. 30, Algebra 2 with Analysis

Write an exponential function of the form $f(x) = ab^x$ whose graph passes through the given points.

1. (1, 6) and (2, 18)

2. (0, 4) and (1, 20)

3. (1, 20) and (3, 80)

4. (2, 60) and (3, 20)

5. (2, 2) and (4, 18)

For each set of data in #1 – 7 below:

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- a. Use the exponential regression feature of a graphing calculator to determine an exponential function that models the data.
- b. According to the model, how many bacteria _____ will there be after 7 hours?
9. The spending for health services and supplies in the United States beginning in 1970 are shown in the table below.

Number of years since 1970 (x)	0	5	10	15	20
Spending (billions of dollars) (y)	69.1	124.7	238.9	407.2	652.4

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Unit 6, Holt Resource
Algebra 2 with Analysis, pp. 30

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