Name _____ Date _____ Class _____

LESSON 9-6

Problem Solving

Modeling Real-World Data

The table shows the population of Lincoln Valley over the last 7 years. How might the population grow in the future if the current trend continues.

Lincoln Valley Population 2000–2006							
Year	1	2	3	4	5	6	7
Population	1049	1137	1229	1326	1434	1542	1662

1. What is the independent variable? What is the dependent variable? Assign *x* or *y* to each variable.

2. Make a scatter plot of the data. Do the data form a linear pattern? For this to be true, explain what must be true about the first differences.

3. Use the table of data. The problem is started for you.

a. Find the first differences.

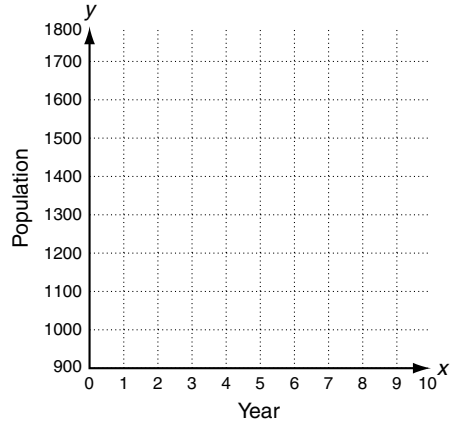
1137 − 1049 = 88, 1229 − 1137 = 92,

b. Find the second differences.

92 − 88 = 4,

c. Find the third differences.

d. Find the ratios between *y*-values.



4. What kind of function will best describe the data? Justify your conclusion.

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Lincoln Valley Population 2000–2006							
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1. What is the independent variable? What is the dependent variable? Assign x or y to each variable.

The independent variable (x) is the year. The dependent variable (y) is the population.

2. Make a scatter plot of the data. Do the data form a linear pattern? For this to be true, explain what must be true about the first differences.

Possible answer: The first few points appear to be linear, but the later points start a curve upward. For the data to be linear, the first differences must be constant.

3. Use the table of data. The problem is started for you.

a. Find the first differences.

1137 − 1049 = 88, 1229 − 1137 = 92,

97, 108, 120

b. Find the second differences.

92 − 88 = 4, 5, 11, 0, 12

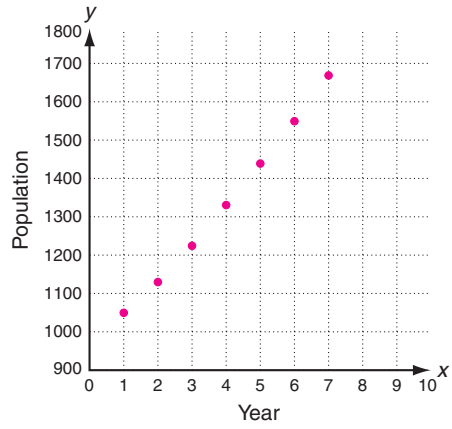
c. Find the third differences.

1, 6, −11, 12

d. Find the ratios between y-values.

1137 ÷ 1049 = 1.08,
1229 ÷ 1137 = 1.08 . .

All ratios round to 1.08



4. What kind of function will best describe the data? Justify your conclusion.

Exponential function, because the ratios between y-values are almost constant