

ACTIVITY 8.5

Developing Concepts

Group Activity for use with Lesson 8.5

Linear and Exponential Growth Models

► **QUESTION** How are linear growth models and exponential growth models different?

SET UP

Work in a small group.

MATERIALS

graph paper

► **EXPLORING THE CONCEPT**

1 The equation $y = 5x + 20$ is a *linear growth model*. Copy and complete the table.

x	0	1	2	3	4	5
y	20	25	?	?	?	?

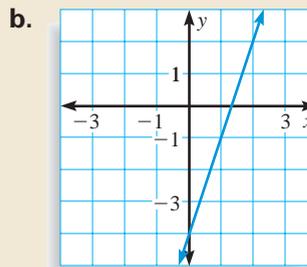
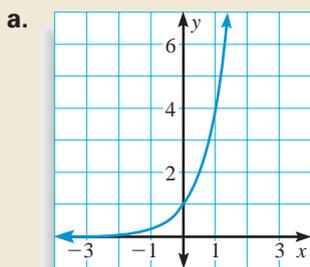
2 Graph $y = 5x + 20$.

3 The equation $y = 5^x$ is an *exponential growth model*. Copy and complete the table.

x	0	1	2	3	4	5
y	1	5	?	?	?	?

4 Graph $y = 5^x$.

5 Which of the graphs below shows a *linear growth model*? Which shows an *exponential growth model*? Explain how you know.



► **DRAWING CONCLUSIONS**

In Exercises 1–6, identify the equation as a *linear growth model* or an *exponential growth model*.

1. $y = x + 5$

2. $y = 3^x$

3. $y = 10 + 2x$

4. $y = 15 + 2^x$

5. $y = 5(4x - 7)$

6. $y = 10(1.2)^x$

7. Look at your data and graph in Steps 1 and 2 to complete the statement.

A linear growth model increases the ? amount for each unit on the x -axis.

8. Describe the rate of increase in an exponential growth model.

9. **CRITICAL THINKING** You accept a job that pays \$20,000 your first year.

Would you rather receive a raise of \$500 each year or a raise of 3% of your current salary each year? Does your answer depend on how long you plan to stay at the job? Explain your reasoning.