

### Finding an Exponential Growth Rate

#### Exponential Growth Rate

If  $A_0$  and  $A_1$  are the quantities for any two times, then the growth rate between those times,  $r$ , is given by

$$\frac{A_1}{A_0} = 1 + r$$

#### EXAMPLE 5 Finding an Exponential Growth Rate

You purchase 100 shares of a stock for \$4.35 per share. One month later, the value of the stock is \$4.55 per share.

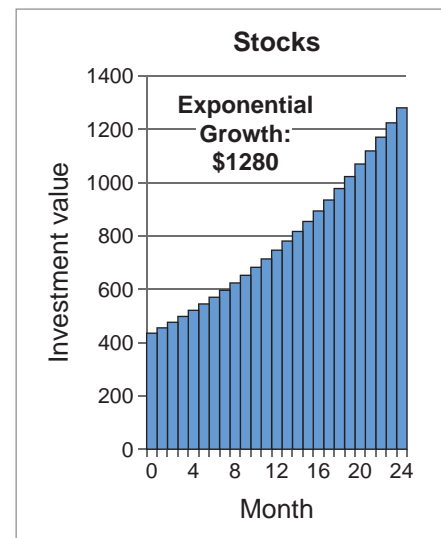
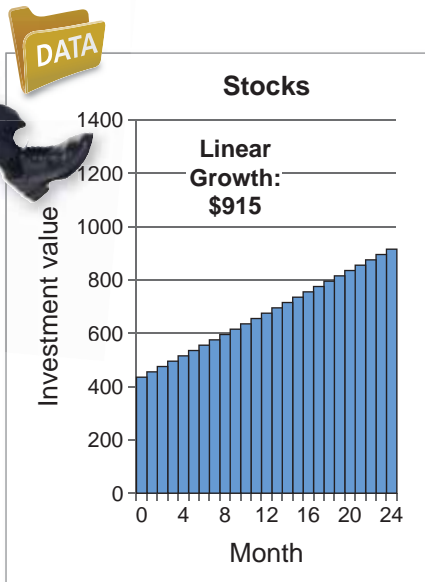
- a. **Linear Growth:** The value of the stock continues to increase by the *same dollar amount* each month. How much will your investment be worth in 2 years?
- b. **Exponential Growth:** The value of the stock continues to increase by the *same percent* each month. How much will your investment be worth in 2 years?

$$\frac{4.55}{4.35} \approx 1.046$$

#### SOLUTION

a. **Linear Growth:** If the stock continues to increase by \$0.20 per month, each share will be worth  $4.35 + 24(0.2) = \$9.15$ . So, your investment will be worth  $100(9.15) = \$915.00$ .

b. **Exponential Growth:** The rate of growth from \$4.35 to \$4.55 is about 4.6%. If the stock continues to grow at this rate, in 2 years each share will be worth  $4.35(1.046)^{24} = \$12.80$ . So, your investment will be worth about  $100(12.8) = \$1280.00$ .



#### ✓ Checkpoint

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Using each type of growth, how much will the stock be worth in 4 years? Illustrate each type with a graph.

