VISUAL 6.1 ▲ Warm-Up

Two students, Kelsey and David, are making graphs to show lumber needed for building bird houses. The available lumber is all ¾ inches thick and 6 inches wide. Their plans show that they need 3 linear feet of the available lumber for each birdhouse.

1. Kelsey made the table below to help her create her graph. Each board, x, is 3 feet long. The dependent variable, y, represents total length in feet. Using the slope formula, calculate the slope of the line represented. The slope is _____

X	y
1	3
2	6
3	9
4	12
5	15

2. David made the table below for his graph. Each board, x, is 36 inches long. The dependent variable, y, represents total length in inches. Calculate the slope of the line represented. The slope is _____

x	y
1	36
2	72
3	108
4	144
5	180

3. (a) In what ways are these two relationships the same?

_____

(b) In what ways are these two relationships different?

_____

4. If the number of boards increases from 2 to 4, what is the percent increase in the number of boards? _____

VISUAL 6.1 (continued)

5. If the total length increases from 6 feet to 12 feet, what is the percent increase in the total length? _____

6. If the total length increases from 72 inches to 144 inches, what is the percent increase in the total length? _____

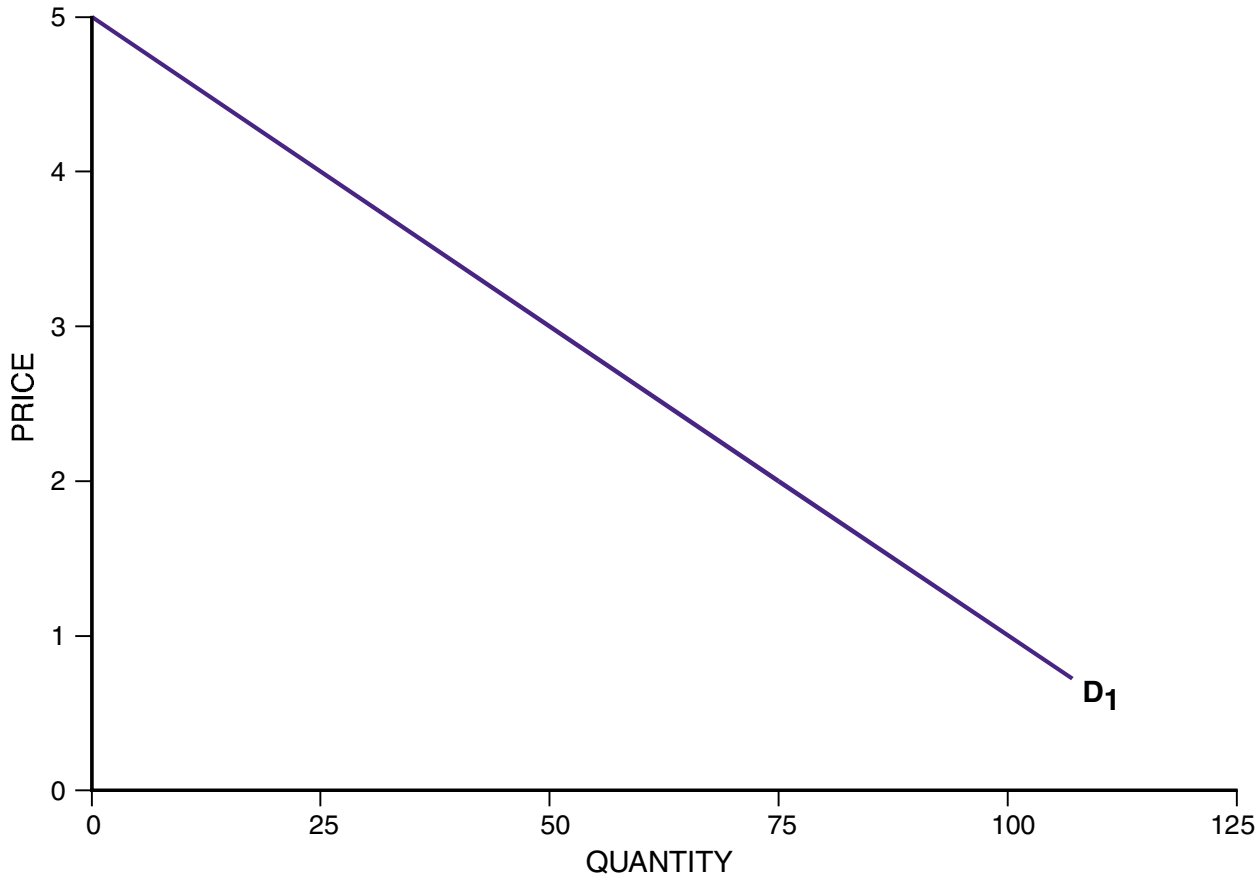
7. In problem #1 what is the ratio of $\frac{\text{percent of increase in x}}{\text{percent of increase in y}}$? _____

8. In problem #2 what is the ratio of $\frac{\text{percent of increase in x}}{\text{percent of increase in y}}$? _____

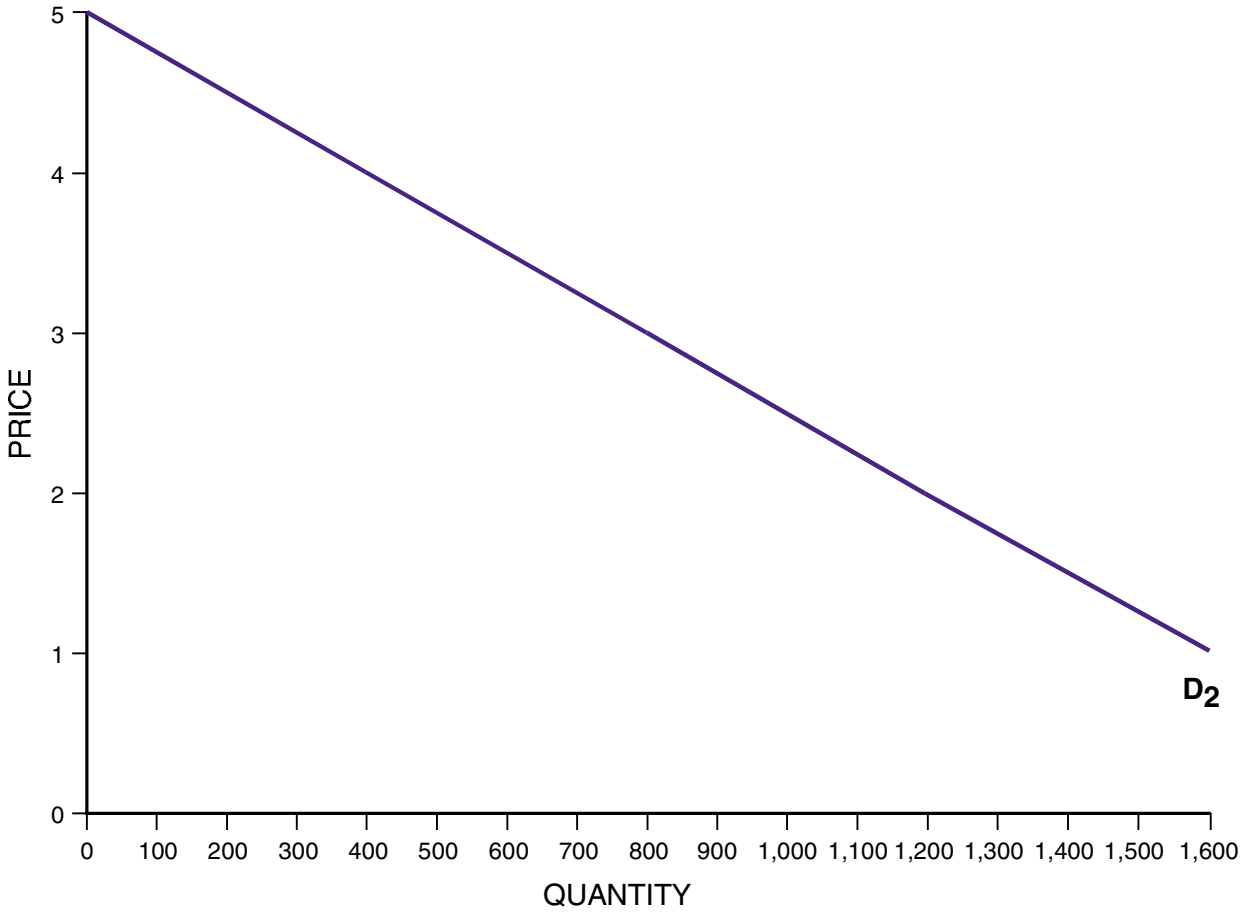
9. Did units make a difference in our percent calculations? _____

10. What happened to the units in calculating the ratios in problems 7 and 8?

VISUAL 6.2



VISUAL 6.3



VISUAL 6.4 ▲ The Price Elasticity of Demand

$$\text{Price Elasticity of Demand} = \frac{\text{percent change in } Q_d}{\text{percent change in price}}$$

$$E_d = \frac{\dfrac{Q_{d1} - Q_{d0}}{Q_{d0}}}{\dfrac{P_1 - P_0}{P_0}}$$

This formula can be revised to = $\dfrac{Q_{d1} - Q_{d0}}{Q_{d0}} \cdot \dfrac{P_0}{P_1 - P_0} = \dfrac{Q_{d1} - Q_{d0}}{P_1 - P_0} \cdot \dfrac{P_0}{Q_{d0}}$

Note that $\dfrac{Q_{d1} - Q_{d0}}{P_1 - P_0}$ is the reciprocal of the unchanging slope of the line.