

**A2.A.5: Inverse Variation 3: Use direct and inverse variation to solve for unknown values**

- 1 If  $p$  and  $q$  vary inversely and  $p$  is 25 when  $q$  is 6, determine  $q$  when  $p$  is equal to 30.
- 2 For a given set of rectangles, the length is inversely proportional to the width. In one of these rectangles, the length is 12 and the width is 6. For this set of rectangles, calculate the width of a rectangle whose length is 9.
- 3 When air is pumped into an automobile tire, the pressure is inversely proportional to the volume. If the pressure is 35 pounds when the volume is 120 cubic inches, what is the pressure, in pounds, when the volume is 140 cubic inches?
- 4 Boyle's Law states that the pressure of compressed gas is inversely proportional to its volume. The pressure of a certain sample of a gas is 16 kilopascals when its volume is 1,800 liters. What is the pressure, in kilopascals, when its volume is 900 liters?
- 5 A pulley that has a diameter of 8 inches is belted to a pulley that has a diameter of 12 inches. The 8-inch-diameter pulley is running at 1,548 revolutions per minute. If the speeds of the pulleys vary inversely to their diameters, how many revolutions per minute does the larger pulley make?
- 6 The time it takes to travel to a location varies inversely to the speed traveled. It takes 4 hours driving at an average speed of 55 miles per hour to reach a location. To the *nearest tenth of an hour*, how long will it take to reach the same location driving at an average speed of 50 miles per hour?
- 7 The amount of money each member of a band earns playing at a graduation party varies inversely as the number of members in the band. If the band has five members, each member earns \$70. Write an equation that models the relationship between the number of members in a band,  $n$ , and the amount each member earns,  $d$ . Use the equation to calculate the amount each member earns if there are four members in the band.
- 8 The price per person to rent a limousine for a prom varies inversely as the number of passengers. If five people rent the limousine, the cost is \$70 each. How many people are renting the limousine when the cost *per couple* is \$87.50?
- 9 Explain how a person can determine if a set of data represents inverse variation and give an example using a table of values.

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#### Answer Section

1 ANS:

$$25 \cdot 6 = 30q$$

$$5 = q$$

REF: 011528a2

2 ANS:

$$12 \cdot 6 = 9w$$

$$8 = w$$

REF: 011130a2

3 ANS:

$$35(120) = 140x$$

$$30. \quad 4200 = 140x$$

$$30 = x$$

REF: 060323b

4 ANS:

$$16(1800) = 900x$$

$$32. \quad 28800 = 900x$$

$$32 = x$$

REF: 080523b

5 ANS:

$$8(1548) = 12x$$

$$1032. \quad 12384 = 12x$$

$$1032 = x$$

REF: 010423b

6 ANS:

$$4(55) = 50x$$

$$4.4. \quad 220 = 50x$$

$$4.4 = x$$

REF: 010624b

7 ANS:

$$nd = 350, \$87.50. \quad \begin{array}{l} 4d = 350 \\ d = 87.50 \end{array}$$

REF: 010823b

8 ANS:

$$8. \quad 43.75x = 5(70) \\ x = 8$$

REF: 080123b

9 ANS:

A set of data can represent inverse variation if the product of two variables is constant.

Example

$x$	$y$
1	36
2	18
3	12
4	9
6	6

REF: 010221b