

**A.APR.D.7: Inverse Variation 2**

- 1 In the accompanying table,  $y$  varies inversely as  $x$ . What is the value of  $m$ .

$x$	2	4	$m$
$y$	18	9	3

- 2 If  $p$  and  $q$  vary inversely and  $p$  is 25 when  $q$  is 6, determine  $q$  when  $p$  is equal to 30.
- 3 If  $x$  varies inversely as  $y$ , and  $x = 9$  when  $y = 8$ , find  $x$  when  $y = 12$ .
- 4 If  $x$  varies inversely as  $y$  and  $x = 12$  when  $y = 4$ , what is the value of  $y$  when  $x = 16$ ?
- 5 If  $x$  varies inversely as  $y$  and  $x = 8$  when  $y = 3$ , find the value of  $x$  when  $y = 6$ .
- 6 If  $x$  varies inversely as  $y$ , and  $x = 10$  when  $y = 12$ , what is the value of  $x$  when  $y = 8$ ?
- 7 If  $P$  varies inversely as  $V$ , and  $P = 700$  when  $V = 8$ , find the value of  $V$  when  $P = 350$ .
- 8 If  $x$  varies inversely as  $y$ , and  $x = -34$  when  $y = -2$ , find the value of  $x$  when  $y = 4$ .
- 9 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.
- 10 The width of a rectangle with constant area varies inversely as its length. If the width is 4 when the length is 12, find the width when the length is 16.
- 11 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?
- 12 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?

- 13 According to Boyle's Law, the pressure of a compressed gas is inversely proportional to the volume. If the pressure is 25 pounds per square inch when the volume of gas is 400 cubic inches, find the pressure, in pounds per square inch, when the gas is compressed to 200 cubic inches?
- 14 The speed of a gear varies inversely as the number of teeth it has. If a gear with 24 teeth rotates at a speed of 45 revolutions per minute, how many revolutions per minute will a gear with 36 teeth make?
- 15 The diameter of a wheel varies inversely as the number of revolutions that the wheel makes to cover a certain distance. If a wheel with a 26-inch diameter makes 10 revolutions in covering a certain distance, how many revolutions will a wheel with a diameter of 20 inches make in covering the same distance?
- 16 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?
- 17 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?
- 18 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.
- 19 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?
- 20 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:  
12

REF: 019814siii

2 ANS:  
 $25 \cdot 6 = 30q$   
 $5 = q$

REF: 011528a2

3 ANS:  
6

REF: 019714siii

4 ANS:  
3

REF: 089815siii

5 ANS:  
4

REF: 010208siii

6 ANS:  
15

REF: 060315siii

7 ANS:  
16

REF: 069814siii

8 ANS:  
17

REF: 010417siii

9 ANS:  
 $12 \cdot 6 = 9w$   
 $8 = w$

REF: 011130a2

10 ANS:  
3

REF: 019914siii

11 ANS:

$$35(120) = 140x$$

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

$$30 = x$$

REF: 060323b

12 ANS:

$$16(1800) = 900x$$

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

$$32 = x$$

REF: 080523b

13 ANS:

50

REF: 089338siii

14 ANS:

30

REF: 080314siii

15 ANS:

13

REF: 089509siii

16 ANS:

$$8(1548) = 12x$$

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

$$1032 = x$$

REF: 010423b

17 ANS:

$$4(55) = 50x$$

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

$$4.4 = x$$

REF: 010624b

18 ANS:

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

REF: 010823b

19 ANS:

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

REF: 080123b

20 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