

## Practice: Direct, Inverse, and Joint Variation

Name: \_\_\_\_\_

**Directions:** State whether each equation represents a direct, inverse, or joint variation. State the constant of variation.

1.  $y = 2x$

2.  $\frac{x}{5} = y$

3.  $xy = 12$

4.  $D = \frac{3}{4}gh$

**Directions:** Write an equation for each of the following.

5. b varies directly with the square of t

6. y is inversely proportional to the cube root of r

7. r varies jointly as t and u

8. m varies directly as the square of n and inversely to p.

**Directions:** Write an equation for each variation and find the value of the constant of variation.

9. N varies jointly as p and q.  $N=72$  when  $p=3$  and  $q=2$

10. Y varies directly as x and inversely as z.  $y=32$  when  $x=4$  and  $z=8$ .

11. W varies inversely as z squared.  $W=3$  when  $z=3$

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**Directions:** Solve each variation.

12. If  $y$  varies inversely as  $x$  and  $y=2$  when  $x=8$ , find  $x$  when  $y=14$ .

13. Suppose  $y$  varies jointly with  $x$  and  $z$ . If  $y=20$  when  $x=2$  and  $z=5$ , find  $y$  when  $x=14$  and  $z=8$

14. If  $m$  varies inversely as the square root of  $v$ , and  $s=6$  when  $v=64$ , then find  $s$  when  $v=121$ .

15. If  $t$  varies jointly with  $x$  and the square of  $v$ , and  $t=39$  when  $x = \sqrt{10}$  and  $v=3.87$ , find  $t$  when  $x = \sqrt{3}$  and  $v=7.21$

**Directions:** Solve each of the following problems.

1. The cost of material used in making a Frisbee varies directly with the square of its diameter. If it costs the manufacturer \$0.45 for the material of a Frisbee with a 9-inch diameter, then what is the cost for the material for a Frisbee with a 12-inch diameter?
2. The time required to process a shipment of goods at Wal-Mart varies directly with the number of goods and inversely with the number of workers assigned. If 15,000 items can be processed by 8 workers in 10 hours, then how long would it take 12 workers to process 20,000 items?
3. The maximum load of a horizontal beam that is supported at both ends varies jointly as the width and the square of the height and inversely as the length between the supports. A beam 6 m long, 0.1 m wide, and 0.06 m high supports a load of 360 kg. What is the maximum load supported by a beam 16 m long, 0.2 m wide, and 0.08 m high?