

Variation Velocity

Find the constant, write the rule, solve the problem.

GRADE 8 • TEKS 8.5.E

8.5.E "solve problems involving direct variation;"

NAME _____

DATE _____

DIRECT VARIATION RULE

In a direct variation, $y = kx$, where k is the constant of variation. Find k by dividing y by x , then use the equation to find an unknown value.

WORKED EXAMPLE

y varies directly with x . If $y = 65$ when $x = 5$, find y when $x = 9$.

1. Write the rule: $y = kx$.
2. Substitute the known pair: $65 = k(5)$, so $k = 13$.
3. Use $x = 9$: $y = 13(9) = 117$.

Answer: $y = 117$

PRACTICE 6 problems

- 1** y varies directly with x . If $y = 21$ when $x = 7$, find k .

ANSWER _____

- 2** For the direct variation $y = 6x$, find y when $x = 12$.

ANSWER _____

- 3** y varies directly with x . If $y = 14$ when $x = 2$, find y when $x = 10$.

ANSWER _____

- 4** For the direct variation $y = (1/4)x$, find y when $x = 16$.

ANSWER _____

- 5** y varies directly with x and passes through the point $(-12, 24)$. Write the equation.

ANSWER _____

- 6** For the direct variation $y = -4x$, find x when $y = -28$.

ANSWER _____

APPLY IT Show your work

- 1** Six concert tickets cost \$48. The total cost varies directly with the number of tickets. How much do 10 tickets cost?

WORK SPACE

ANSWER _____

- 2** On a bike club ride, a student travels 18 miles in 2 hours at a constant speed. Distance varies directly with time. How far will the student travel in 7 hours?

WORK SPACE

ANSWER _____

CHALLENGE One step up

y varies directly with x . When $x = 15$, $y = 10$. Find x when $y = 26$. Show the equation you use.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	y varies directly with x. If $y = 21$ when $x = 7$, find k.	k=3
2	For the direct variation $y = 6x$, find y when $x = 12$.	y = 72
3	y varies directly with x. If $y = 14$ when $x = 2$, find y when $x = 10$.	y = 70
4	For the direct variation $y = (1/4)x$, find y when $x = 16$.	y=4
5	y varies directly with x and passes through the point $(-12, 24)$. Write the equation.	y = -2x
6	For the direct variation $y = -4x$, find x when $y = -28$.	x=7

PART 2 • APPLY IT

1. **\$80** Divide \$48 by 6 to find a unit price of \$8 per ticket. Multiply 10 by \$8.
2. **63 miles** Divide 18 by 2 to find a speed of 9 miles per hour. Multiply 9 by 7.

CHALLENGE

$y = (2/3)x$, so $x = 39$

Accept equivalent equation forms, such as $2x/3$ for $(2/3)x$. For direct-variation equations, accept $y = kx$ with the correct constant of variation.