LESSON MAKER PRO

Proportion Equation Power

Write equations that show constant rates.

GRADE 7 · 7.RP.A.2c

CCSS.Math.Content.7.RP.A.2c "Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p..."

NAME _____ DATE _____

THE BIG IDEA

In a proportional relationship, y = kx. The number k is the constant of proportionality, or the amount of y for 1 unit of x.

WORKED EXAMPLE

A player earns 7 points for each level completed. Let x be the number of levels and y be the total points. Write an equation.

1. The rate is 7 points for 1 level, so k = 7.
2. Use y = kx.
3. Substitute 7 for k: y = 7x.

Answer: y = 7x

PRACTICE 6 problems

1 The amount y is proportional to x with a constant of proportionality of 4. Write an equation.

ANSWER _____

2 The equation y = 9x represents a proportional relationship. Find y when x = 3.

ANSWER _____

3 A snack stand charges $3 per granola bar. Let x be the number of bars and y be the total cost. Write an equation and find y when x = 5.

ANSWER _____

4 The equation y = 1/2x represents a proportional relationship. State k, then find y when x = 10.

ANSWER _____

5 A proportional relationship includes the pairs (2, 16) and (5, 40). Write an equation that relates y to x.

ANSWER _____

6 In a proportional relationship, y = 54 when x = 6. Write the equation that relates y to x.

ANSWER _____

APPLY IT Show your work

1 On an art app, each design you post earns 12 tokens. Let x be the number of designs and y be the number of tokens. Write an equation, then find the number of tokens for 8 designs.

WORK SPACE

ANSWER _____

2 Use the table. The total cost y is proportional to the number of sticker packs x. Write an equation, then find the cost of 8 packs.

STICKER PACK SALES

Packs, x	Total cost, y
3	18
5	30

ANSWER _____

CHALLENGE One step up

A video creator earns tokens in a proportional relationship. When x = 4 videos, y = 26 tokens. Write an equation that relates y to x. Then find the number of videos when y = 91.

WORK SPACE AND ANSWER

ANSWER KEY

Proportion Equation Power

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	The amount y is proportional to x with a constant of proportionality of 4. Write an equation.	**y = 4x**
2	The equation y = 9x represents a proportional relationship. Find y when x = 3.	**27**
3	A snack stand charges $3 per granola bar. Let x be the number of bars and y be the total cost. Write an equation and find y when x = 5.	**y = 3x; y = 15**
4	The equation y = 1/2x represents a proportional relationship. State k, then find y when x = 10.	**k = 1/2; y = 5**
5	A proportional relationship includes the pairs (2, 16) and (5, 40). Write an equation that relates y to x.	**y = 8x**
6	In a proportional relationship, y = 54 when x = 6. Write the equation that relates y to x.	**y = 9x**

PART 2 · APPLY IT

1. **y = 12x; 96 tokens** The constant of proportionality is 12 tokens per design, so y = 12x. Substitute 8 for x to get y = 96.
2. **y = 6x; $48** Divide total cost by packs to find the constant of proportionality: 18 / 3 = 6. The equation is y = 6x, and 6(8) = 48.

CHALLENGE

y = 13/2x; x = 14

Accept equivalent equation forms, such as 2y = 13x for the challenge. For monetary answers, accept 15 or $15 when the context makes the units clear.