

Find the Rate

Use y/x to uncover the constant of proportionality.

GRADE 7 • TEKS 7.4.C

7.4.C "determine the constant of proportionality ($k = y/x$) within mathematical and real-world problems;"

NAME _____

DATE _____

THE CONSTANT K

In a proportional relationship, $y = kx$. Find the constant of proportionality by dividing y by x , so $k = y/x$. The ratio stays the same for every pair of values in the relationship.

WORKED EXAMPLE

When $x = 3$ and $y = 27$, determine k .

1. Use $k = y/x$.
2. Substitute: $k = 27/3$.
3. Divide: $k = 9$.

Answer: $k = 9$

PRACTICE 6 problems

- 1** Use the table to determine the constant of proportionality.

PROPORTIONAL RELATIONSHIP

x	y
2	14
5	35
8	56

ANSWER _____

- 2** When $x = 6$ and $y = 48$, determine k .

ANSWER _____

- 3** When $x = 11$ and $y = -44$, determine k .

ANSWER _____

- 4** When $x = 8$ and $y = 20$, determine k . Write your answer as a simplified fraction.

ANSWER _____

- 5** A proportional relationship has $y = 55$ when $x = 11$. Determine k .

ANSWER _____

- 6** A point on $y = kx$ is $(16, -40)$. Determine k . Write your answer as a simplified fraction.

ANSWER _____

APPLY IT Show your work

- 1** At a gaming tournament, 5 snack booths sell 40 cups of fruit punch altogether. Let x be the number of booths and y be the total cups sold. Determine k and tell what it means.

WORK SPACE

ANSWER _____

- 2** An art club makes 56 buttons during 8 meetings. Let x be the number of meetings and y be the total number of buttons. Determine k and tell what it means.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A mobile game gives 30 bonus coins after 6 completed levels and 50 bonus coins after 10 completed levels. Let x be completed levels and y be bonus coins. Is the relationship proportional? Determine k and explain by finding y/x for both pairs.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Use the table to determine the constant of proportionality.	$k = 7$
2	When $x = 6$ and $y = 48$, determine k .	$k = 8$
3	When $x = 11$ and $y = -44$, determine k .	$k = -4$
4	When $x = 8$ and $y = 20$, determine k . Write your answer as a simplified fraction.	$k = 5/2$
5	A proportional relationship has $y = 55$ when $x = 11$. Determine k .	$k = 5$
6	A point on $y = kx$ is $(16, -40)$. Determine k . Write your answer as a simplified fraction.	$k = -5/2$

PART 2 • APPLY IT

- $k = 8$ cups per booth** Compute $k = y/x = 40/5 = 8$. The constant means each booth sells 8 cups of fruit punch.
- $k = 7$ buttons per meeting** Compute $k = y/x = 56/8 = 7$. The constant means the club makes 7 buttons each meeting.

CHALLENGE

Yes. $30/6 = 5$ and $50/10 = 5$, so $k = 5$ coins per level.

Accept equivalent simplified fractional forms. For the challenge, require both ratios and a statement that equal ratios show the relationship is proportional.