

Slope Signal

Find the constant rate and write direct variation equations.

GRADE 7 • 7.PFA.1.a

7.PFA.1.a "Determine the slope, m , as the rate of change in a proportional relationship between two quantities given a table of values, graph, or contextual situation and write an equation in the form $y = mx$ to represent the direct variation..."

NAME _____

DATE _____

THE BIG IDEA

In a proportional relationship, the ratio y/x stays constant. This constant is the slope, m , so divide y by x and write the equation $y = mx$. A direct variation graph goes through $(0, 0)$.

WORKED EXAMPLE

Determine the slope and write an equation for this proportional relationship. x : 7 14 y : 21 42

1. Divide y by x : $m = 21/7$.
2. Simplify: $m = 3$.
3. Put m in $y = mx$: $y = 3x$.

Answer: $m = 3$; $y = 3x$

PRACTICE 6 problems

- 1** Determine the slope and write an equation for this proportional relationship. x : 2 4 6 y : 10 20 30

ANSWER _____

- 2** A graph of a proportional relationship passes through $(-4, 8)$, $(1, -2)$, and $(4, -8)$. Determine the slope and write the equation.

ANSWER _____

- 3** Determine the slope and write an equation for this proportional relationship. x : 2 4 6 y : 5 10 15

ANSWER _____

- 4** A graph of a proportional relationship passes through $(-2, 8)$, $(1, -4)$, and $(2, -8)$. Determine the slope and write the equation.

ANSWER _____

- 5** A proportional relationship includes the point $(5, 4)$. Determine the slope and write the equation.

ANSWER _____

- 6** Determine the slope and write an equation for this proportional relationship. x : 5 10 15 y : 4 8 12 16

ANSWER _____

APPLY IT Show your work

- 1** A digital art club sells 8 sticker sheets for \$20. Let x be the number of sticker sheets and let y be the total cost in dollars. Find the cost per sheet and write an equation that shows the total cost.

WORK SPACE

ANSWER _____

- 2** A gaming tournament charges the same entry fee for every team. Four team entries cost \$20. Let x be the number of team entries and let y be the total cost in dollars. Find the entry fee and write an equation that shows the total cost.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Relationship A has this table: x : 2 4 6 y : 8 16 24 Relationship B has this table: x : 2 4 6 y : 10 20 30 Which relationship has the greater y -value for the same positive x -value? Write both equations and explain using slope.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Determine the slope and write an equation for this proportional relationship. x: 2 4 6 y: 10 20 30	$m = 5$; $y = 5x$
2	A graph of a proportional relationship passes through (-4, 8), (1, -2), and (4, -8). Determine the slope and write the equation.	$m = -2$; $y = -2x$
3	Determine the slope and write an equation for this proportional relationship. x: 2 4 6 y: 5 10 15	$m = 5/2$; $y = 5/2x$
4	A graph of a proportional relationship passes through (-2, 8), (1, -4), and (2, -8). Determine the slope and write the equation.	$m = -4$; $y = -4x$
5	A proportional relationship includes the point (5, 4). Determine the slope and write the equation.	$m = 4/5$; $y = 4/5x$
6	Determine the slope and write an equation for this proportional relationship. x: 5 10 15 20 y: 4 8 12 16	$m = 4/5$; $y = 4/5x$

PART 2 • APPLY IT

- $m = 5/2$; $y = 5/2x$** Divide the total cost by the number of sheets: $20/8 = 5/2$ dollars per sheet. Use $5/2$ as the slope in $y = mx$.
- $m = 5$; $y = 5x$** Divide the total cost by the number of entries: $20/4 = 5$ dollars per entry. Use 5 as the slope in $y = mx$.

CHALLENGE

Relationship B. A: $y = 4x$ and B: $y = 5x$. The slope of B, 5, is greater than the slope of A, 4, so B has the greater y-value for the same positive x-value.

Accept equivalent equation forms, such as $y = 5x/2$ for $y = 5/2x$. Students may find slope using any nonzero ordered pair because each relationship is proportional.