

Slope Showdown

Graph proportional relationships and compare their rates.

GRADE 7 • 7.PAR.4.8

7.PAR.4.8 "Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways."

NAME _____

DATE _____

CONNECT THE REPRESENTATIONS

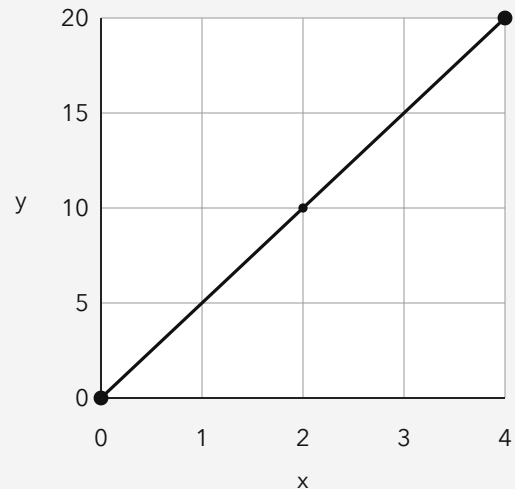
In $y = rx$, the unit rate r is the slope: change in y divided by change in x . A proportional graph passes through the origin. Compare rates using the units and axis scales, not just how steep lines look on different-sized graphs.

WORKED EXAMPLE

A pump delivers y liters in x minutes. Read its graph and write its rate and equation.

1. Read $(0, 0)$ and $(2, 10)$.
2. Slope = $(10 - 0)/(2 - 0) = 5$ liters per minute.

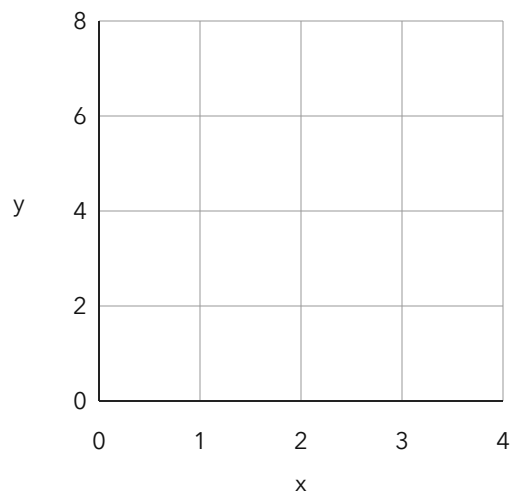
Answer: Rate 5 L/min; $y = 5x$.



PRACTICE 4 problems

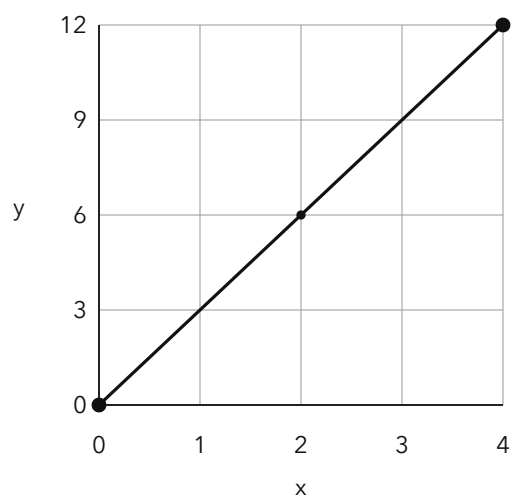
- 1** Graph $y = 2x$ for $0 \leq x \leq 4$. Plot the origin and at least two more points; connect them. State the slope.

ANSWER _____



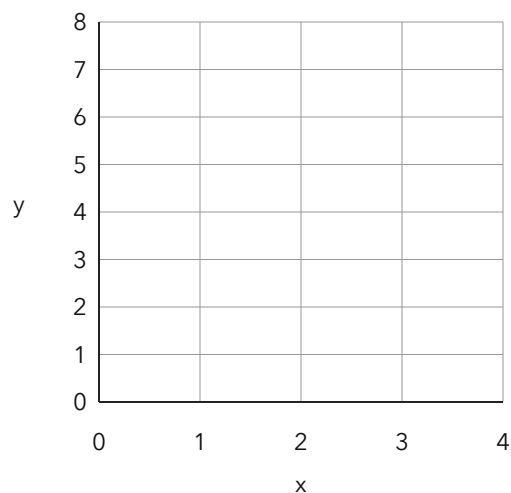
- 2** Read this proportional graph. Find its unit rate and write its equation. How much does y increase when x increases by 2?

ANSWER _____



- 3** A proportional relationship has x -values 0, 2, 4 and corresponding y -values 0, 3, 6. Graph it for $0 \leq x \leq 4$ and find its slope.

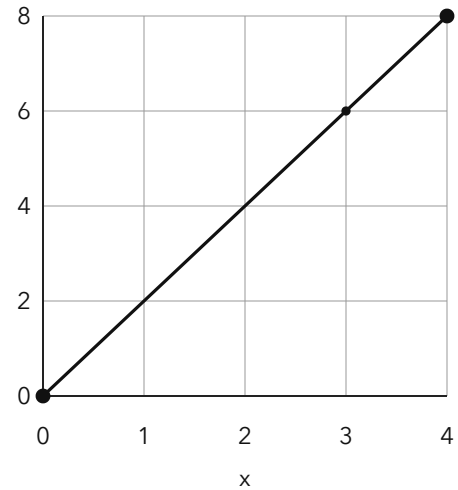
ANSWER _____



- 4** Relationship A is $y = 4x$. Relationship B is the graph. Compare their rates and state the difference.

ANSWER _____

y

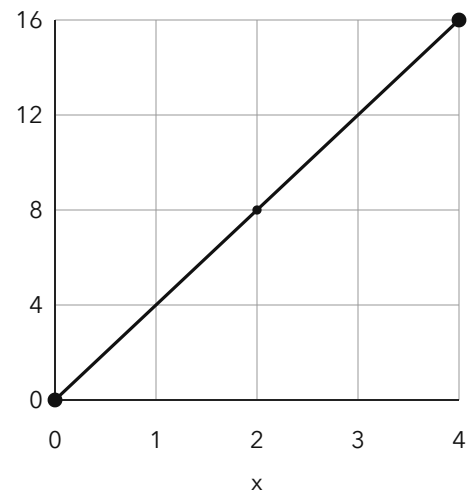


APPLY IT Show your work

- 1** Two hoses fill containers from empty. Hose A is graphed: x minutes, y liters. Hose B delivers 9 liters in 3 minutes at a constant rate. Which fills faster? Find each amount after 4 minutes.

REASONING AND ANSWER

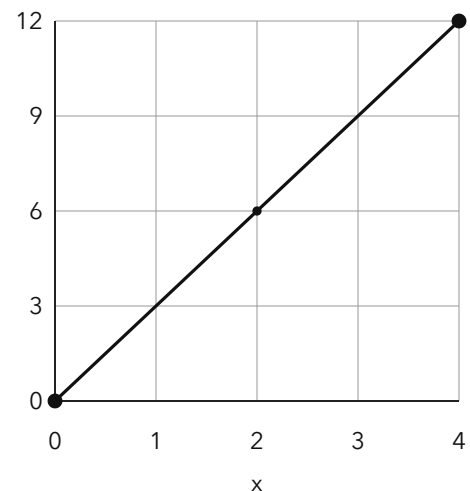
y



- 2** For bulk rice, x is kilograms and y is dollars. Store A uses $y = 2.5x$. Store B is graphed. Which is cheaper per kilogram? How much do 4 kg cost at each store?

REASONING AND ANSWER

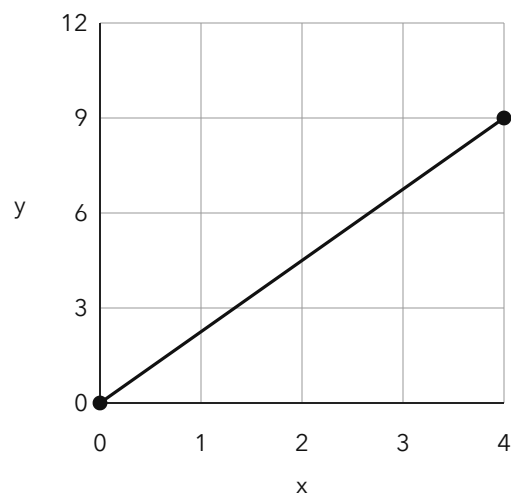
y



CHALLENGE One step up

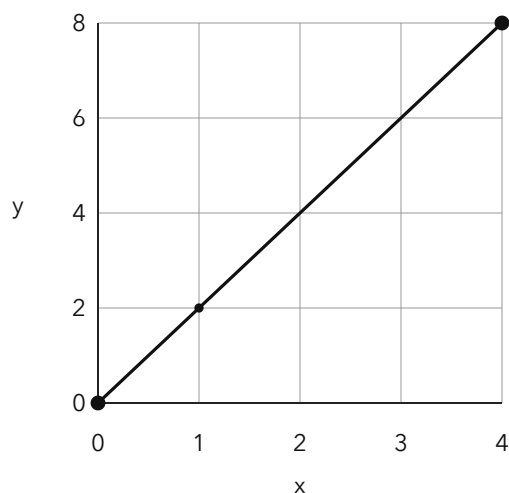
A is $y = 2x$. B is proportional with (2, 5) and (4, 10). C is graphed. Rank the rates from least to greatest. Would doubling only the printed height of graph C change its rate? Explain.

WORK SPACE AND ANSWER



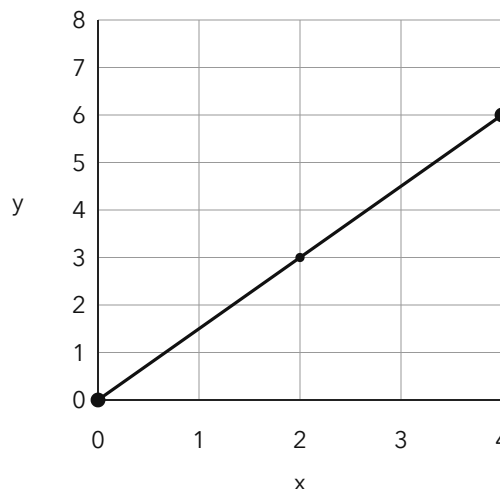
PRACTICE 1

Line through (0, 0), (1, 2), (4, 8); slope 2.



PRACTICE 3

Line through (0, 0), (2, 3), (4, 6); slope $3/2 = 1.5$.



PRACTICE 2

Rate 3; $y = 3x$; y increases by 6.

PRACTICE 4

A has rate 4 and B has rate 2. A is greater by 2.

APPLY IT 1

A: 4 L/min, 16 L. B: 3 L/min, 12 L. A fills faster. A rises 8 liters in 2 minutes. B has rate $9/3 = 3$ liters per minute.

APPLY IT 2

A costs \$2.50/kg and B costs \$3/kg; A is cheaper. Four kg cost \$10 at A and \$12 at B. Read (2, 6), so B has rate $6/2 = 3$. Multiply each rate by 4.

CHALLENGE

A (2), C (2.25), B (2.5). No; C still passes through (4, 9), so its rate remains $9/4 = 2.25$.

Accept other points on the correct line. Construction tasks 1 and 3 need straight connected segments over the specified interval. Rates must use coordinate values, including non-unit vertical scales.