

Point Stories

Read points, explain quantities, and find unit rates.

GRADE 7 • 7.PAR.4.5

7.PAR.4.5 "Use context to explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate."

NAME _____

DATE _____

CONNECT THE REPRESENTATIONS

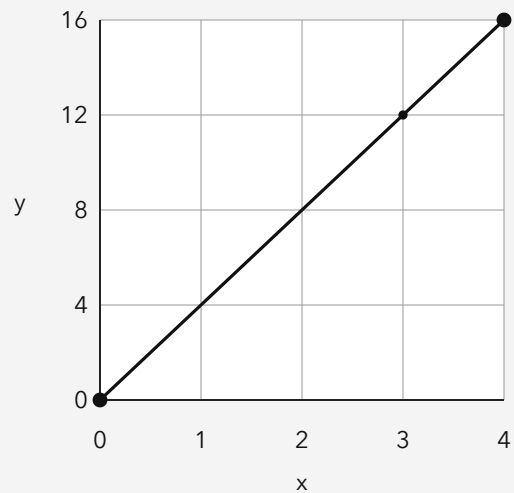
For a proportional relationship, $y = rx$. A point (x, y) pairs an input amount with its output amount. The origin means zero of both quantities; $(1, r)$ shows the output for one input unit.

WORKED EXAMPLE

The graph shows water delivered by a pump during its first 4 minutes: x is minutes and y is liters. Explain $(3, 12)$.

1. Read $x = 3$ minutes and $y = 12$ liters.
2. The rate is $12 / 3 = 4$ liters per minute.

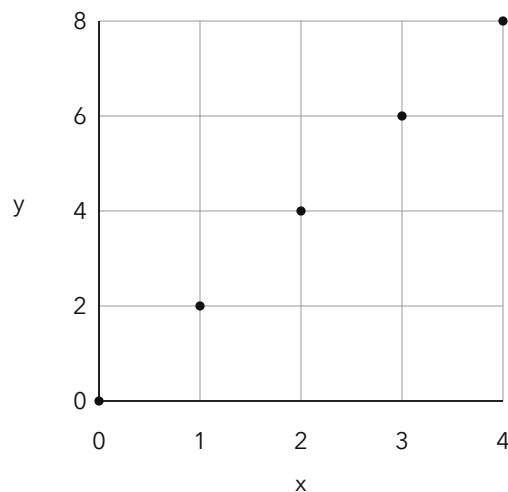
Answer: After 3 minutes, the pump has delivered 12 liters.



PRACTICE 4 problems

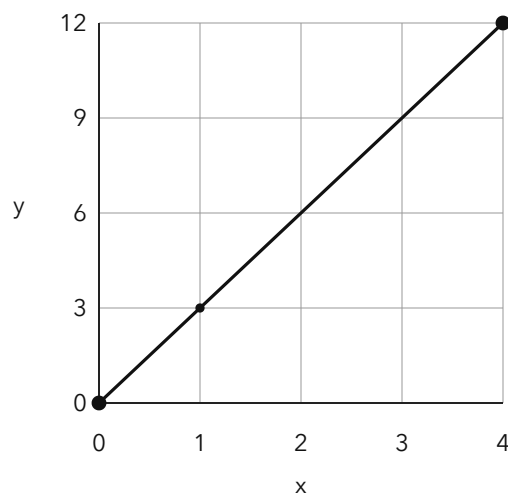
- 1** These dots show packs bought (x) and cards received (y). Read the dot at $x = 3$ and explain it. What does the origin mean?

ANSWER _____



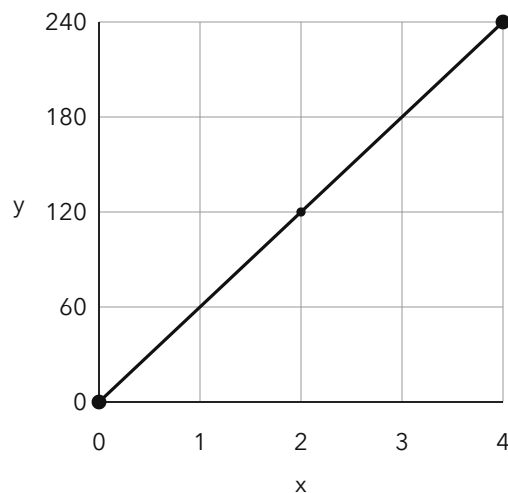
- 2** This pump graph uses x minutes and y liters. Read the point at $x = 1$. State the unit rate with units.

ANSWER _____



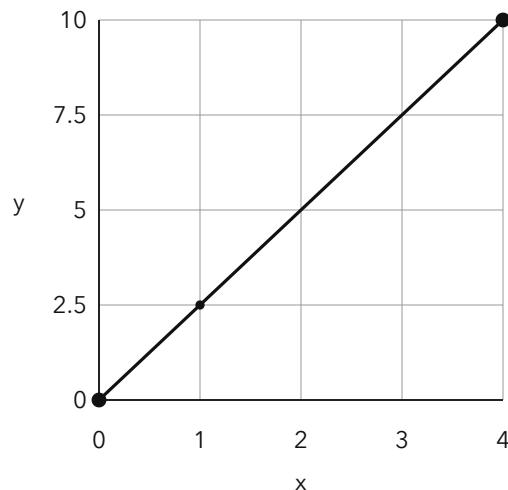
- 3** The graph shows minutes (x) and meters walked (y). Explain the marked point and find the distance walked in 1 minute.

ANSWER _____



- 4** For ribbon, x is meters and y is cost in dollars. Explain the point at $x = 1$. Find the cost of 2 meters.

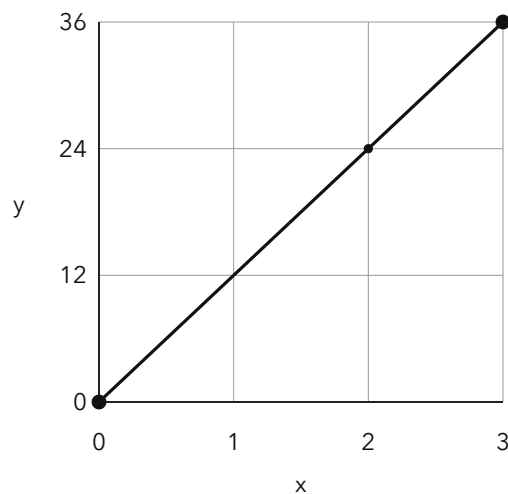
ANSWER _____



APPLY IT Show your work

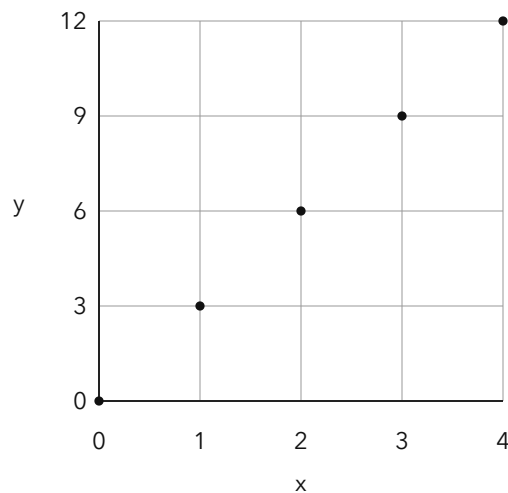
- 1** A bike travels at constant speed for 3 hours. Here x is hours and y is kilometers. Read the marked point, then mark $(1, r)$. Explain that point and the origin.

REASONING AND ANSWER



- 2** A shop sells up to 4 notebooks. The dots use x notebooks and y dollars. A student says the dot at $x = 2$ means 6 notebooks cost \$2. Correct this and explain the unit-rate dot.

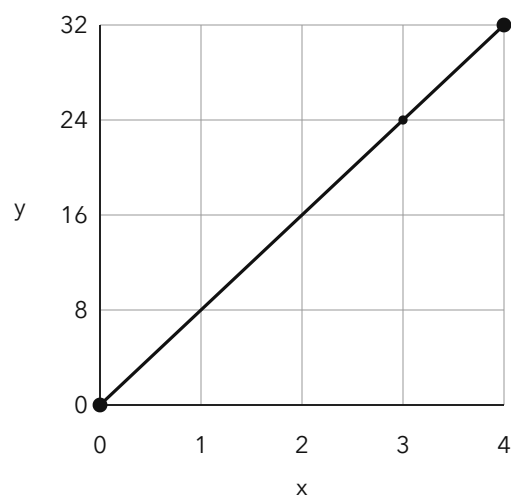
REASONING AND ANSWER



CHALLENGE One step up

This graph shows liters of paint (x) and wall area in square meters (y). Mark the unit-rate point and explain it. A student says (0, 0) means the paint covers nothing at every amount. Correct the claim.

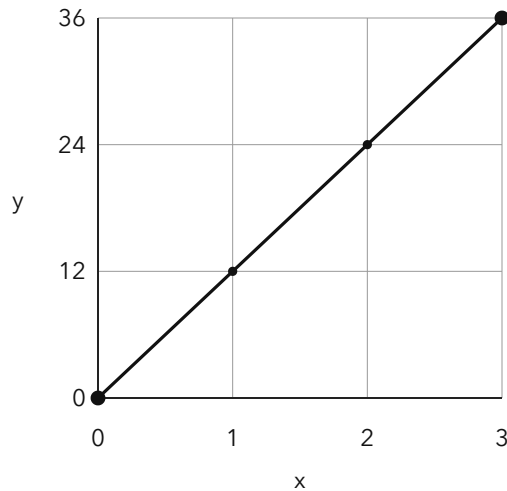
WORK SPACE AND ANSWER



APPLY IT 1

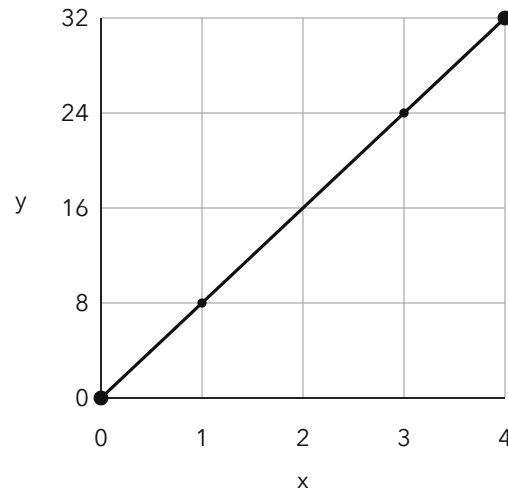
(2, 24): 24 km in 2 hours. (1, 12): 12 km in 1 hour. (0, 0): no time elapsed and no distance traveled. Divide 24 km by 2 h to get 12 km/h.

Locate $x = 1$ on the line.

**CHALLENGE**

(1, 8): 1 liter covers 8 square meters. The origin describes only 0 liters covering 0 square meters, not every amount.

Accept equivalent contextual explanations with both quantities and units.

**PRACTICE 1**

(3, 6): 3 packs contain 6 cards. (0, 0): no packs means no cards.

PRACTICE 2

(1, 3); 3 liters per minute.

PRACTICE 3

(2, 120) means 120 meters in 2 minutes. In 1 minute: 60 meters.

PRACTICE 4

(1, 2.5) means 1 meter costs \$2.50. Two meters cost \$5.

APPLY IT 2

(2, 6) means 2 notebooks cost \$6. (1, 3) means each notebook costs \$3. Read horizontal input first, then vertical output. Notebooks are counted, so the graph uses separate dots.