

Proportional Relationships and Slope: math test, Grade 8 – download the PDF

Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1 Unit rate

/ 3 pts

A drone flies 18 miles in 24 minutes at a steady speed.

- Find its speed in miles per hour. (1 pt)
- Write an equation giving the distance d after t hours. (1 pt)
- How far does it fly in 2.5 hours? (1 pt)

2 Slope from two points

/ 4 pts

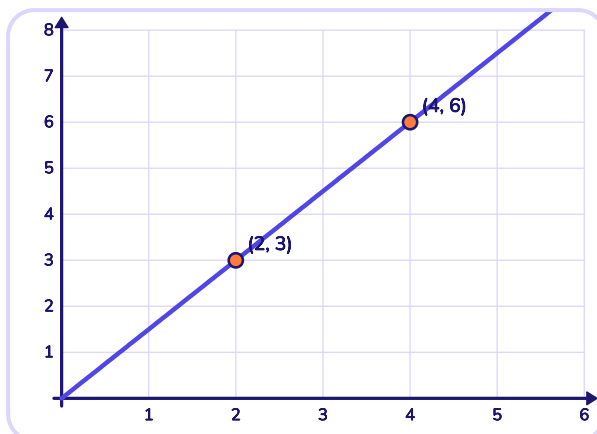
Let $A(-4, 3)$, $B(2, -9)$ and $C(5, -15)$.

- Find the slope of line AB . (2 pts)
- Show that C is on line AB . (2 pts)

3 Reading a graph

/ 3 pts

Use the graph of a proportional relationship (the line passes through $(2, 3)$ and $(4, 6)$).



- Find the slope. (1 pt)
- Write the equation of the line. (1 pt)
- Find y when $x = 10$. (1 pt)

4 Two faucets

/ 4 pts

Faucet A delivers 36 gallons in 8 minutes at a steady rate. For Faucet B, the gallons g after t minutes satisfy $g = 4.2t$.

- Find the rate of Faucet A. (1 pt)
- Which faucet is faster? (1 pt)
- How long does each need to deliver 63 gallons? (2 pts)

5 Similar triangles

/ 3 pts

A small right triangle under a line has run 8 and rise 10. A larger triangle under the same line has rise 35.

- Find the slope of the line. (1 pt)
- Explain why the two triangles are similar. (1 pt)
- Find the run of the larger triangle. (1 pt)

6

True or false?

/ 3 pts

Decide and justify.

- a. The pairs $(3, 12)$, $(5, 20)$, $(8, 32)$ are proportional. (1 pt)
- b. The line through $(2, 6)$ and $(4, 9)$ is proportional. (1 pt)
- c. The slope of the line through $(4, 7)$ and $(4, -2)$ is 0. (1 pt)

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