

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

Test solutions with the detailed point scale. Add up your points and spot what to review.

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

## 1 Unit rate

/ 3 pts

a. 24 minutes = 0.4 hour, so  $\frac{18}{0.4} = 45$  miles per hour. (1 pt)

b.  $d = 45t$ . (1 pt)

c.  $45 \times 2.5 = 112.5$  miles. (1 pt)

## 2 Slope from two points

/ 4 pts

a.  $m = \frac{-9 - 3}{2 - (-4)} = \frac{-12}{6} = -2$ . (2 pts)

b. Slope of  $BC$ :  $\frac{-15 - (-9)}{5 - 2} = \frac{-6}{3} = -2$ . Same slope and shared point  $B$ , so  $A$ ,  $B$ ,  $C$  are on one line. (2 pts)

### 3 Reading a graph

/ 3 pts

- a.  $m = \frac{6-3}{4-2} = \frac{3}{2} = 1.5$ . (1 pt)
- b. The line goes through the origin, so  $y = 1.5x$ . (1 pt)
- c.  $1.5 \times 10 = 15$ . (1 pt)

### 4 Two faucets

/ 4 pts

- a.  $\frac{36}{8} = 4.5$  gallons per minute. (1 pt)
- b.  $4.5 > 4.2$ , so Faucet A is faster. (1 pt)
- c. A:  $\frac{63}{4.5} = 14$  minutes. B:  $\frac{63}{4.2} = 15$  minutes. (2 pts)

### 5 Similar triangles

/ 3 pts

- a.  $\frac{10}{8} = 1.25$ . (1 pt)
- b. Both have a right angle and the same angle at the origin (the line makes the same angle with the horizontal), so their angles match and they are similar. (1 pt)
- c.  $\text{run} = \frac{35}{1.25} = 28$ . (1 pt)

### 6 True or false?

/ 3 pts

- a. True:  $\frac{12}{3} = \frac{20}{5} = \frac{32}{8} = 4$ . (1 pt)
- b. False: the slope is  $\frac{3}{2} = 1.5$ , but  $\frac{6}{2} = 3 \neq 1.5$ , so the line does not pass through the origin. (1 pt)
- c. False: the run is 0, so the line is vertical and the slope is undefined. (1 pt)



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