

Ratios and Proportional Relationships: math test solutions, Grade 7 – 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 rates

/ 4 pts

- a) $\frac{3/8}{1/12} = \frac{3}{8} \times 12 = \frac{36}{8} = 4.5$ miles per hour. (2 pts)
- b) $18.75 \div 2.5 = 7.5$: \$7.50 per pound (1 pt). $3.5 \times 7.5 = 26.25$: the cost is \$26.25 (1 pt).

2 A table of filament

/ 4 pts

- a) $\frac{10.5}{3} = \frac{17.5}{5} = \frac{28}{8} = \frac{42}{12} = 3.5$. The quotients are all equal, so it is proportional. (2 pts)
- b) $k = 3.5$: the printer uses 3.5 grams of filament per minute. (1 pt)
- c) $y = 3.5x$. (1 pt)

3 A drone climbs

/ 3 pts

- a) The points lie on a straight line that goes through $(0, 0)$ (the quotients $\frac{3}{2}, \frac{9}{6}, \frac{15}{10}$ are all 1.5). (1 pt)
- b) $(1, 1.5)$: the drone climbs 1.5 feet each second. (1 pt)
- c) $y = 1.5x$. (1 pt)

4 Backpack deal

/ 4 pts

- a) $120 \times 0.70 = 84$: the sale price is \$84. (2 pts)
- b) $84 \times 1.06 = 89.04$: the final cost is \$89.04. (2 pts)

5 Juice mix

/ 3 pts

- a) $2 + 7 = 9$ parts, and $45 \div 9 = 5$ cups per part. Concentrate: 10 cups; water: 35 cups. (2 pts)
- b) $63 \div 9 = 7$, so concentrate: $2 \times 7 = 14$ cups. (1 pt)

6 Painting rooms

/ 2 pts

- a) It is the constant of proportionality: each room needs 0.75 gallon of paint. (1 pt)
- b) $0.75x = 6$, so $x = 8$ rooms. (1 pt)



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