

Ratios and Proportional Relationships: math test, Grade 7 – download the PDF

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

1 Unit rates

/ 4 pts

- a) A runner covers $\frac{3}{8}$ mile in $\frac{1}{12}$ hour. Find her speed in miles per hour.
- b) Two and a half pounds of cheese cost \$18.75. Find the price per pound, then the cost of $3\frac{1}{2}$ pounds.

2 A table of filament

/ 4 pts

A 3D printer uses y grams of filament in x minutes.

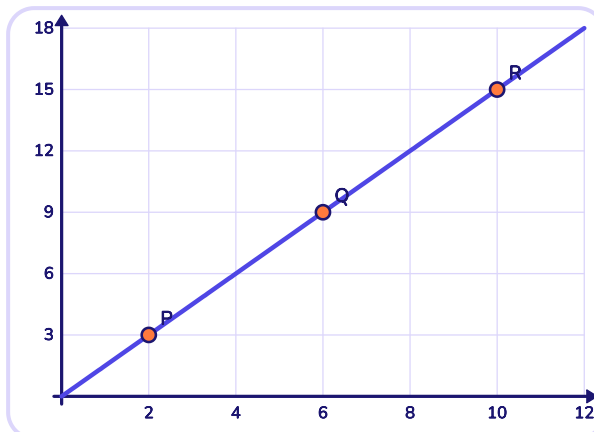
x (minutes)	3	5	8	12
y (grams)	10.5	17.5	28	42

- a) Is the relationship proportional? Justify.
- b) Give the constant of proportionality and its meaning.
- c) Write an equation.

3 A drone climbs

/ 3 pts

The graph shows the height in feet y of a drone after x seconds.



- Explain why the graph shows a proportional relationship.
- Give the point with $x = 1$ and explain what it means.
- Write the equation.

4 Backpack deal

/ 4 pts

A backpack costs \$120. It is on sale for 30% off, and then 6% sales tax is added to the sale price.

- Find the sale price.
- Find the final cost.

5 Juice mix

/ 3 pts

A drink uses juice concentrate and water in the ratio **2 : 7**.

- How many cups of each are in 45 cups of drink?
- How many cups of concentrate are needed for 63 cups of drink?

6 Painting rooms

/ 2 pts

The gallons of paint y needed for x identical rooms satisfy $y = 0.75x$.

- a) What does 0.75 mean in this situation?
- b) How many rooms can be painted with 6 gallons?



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