

Grade 7 · Proportional Relationships · Worksheet

Common Core 7.RP.A.2a, 7.RP.A.2b, 7.RP.A.2d · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

These 20 problems practice standards 7.RP.A.2a, 2b and 2d: deciding whether two quantities are proportional from tables, graphs, bar models and double number lines, and finding the constant of proportionality. Compare the ratio of y to x in every pair, and look for a straight line through the origin. The last six problems compare several relationships and explain common errors.

Grade 7 Common Core: 7.RP.A.2a · 7.RP.A.2b · 7.RP.A.2d

Problem 1: Table check

Decide whether the relationship is proportional. If it is, state the constant of proportionality.

x	2	4	6	8
y	6	12	18	24

Divide y by x in each column.

Problem 2: Table of wages

The table shows how much Diego earns for mowing lawns. Decide whether his earnings are proportional to the hours worked. If they are, state the constant of proportionality with units.

Hours	2	4	6	8
Earnings (dollars)	31	62	93	124

Problem 3: Not constant

Decide whether the table is proportional. Show the ratios that support your answer.

x	1	2	3	4
y	4	7	10	13

Problem 4: Ratios that differ

Decide whether the table is proportional. Show the ratios that support your answer.

x	3	6	9	12
y	8	15	22	29

Problem 5: Cost of gasoline

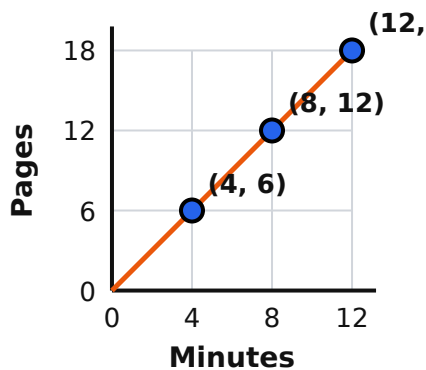
The table shows the cost of gasoline.

Gallons	2	4	6
Cost (dollars)	7.00	14.00	21.00

Is the cost proportional to the number of gallons? Find the constant of proportionality and explain what it means.

Problem 6: Reading speed graph

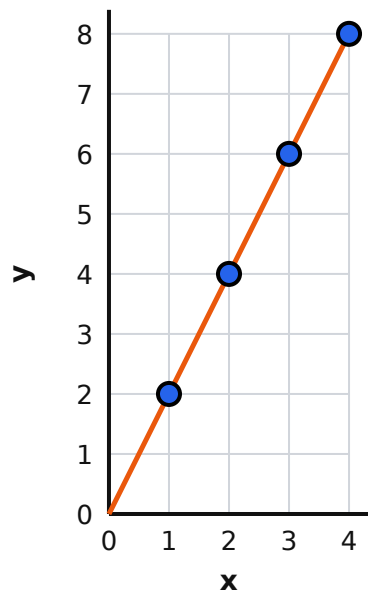
The graph shows the number of pages Jamal reads in x minutes. Is the relationship proportional? If it is, find the constant of proportionality with units.



Pages read in x minutes.

Problem 7: Graph through the origin

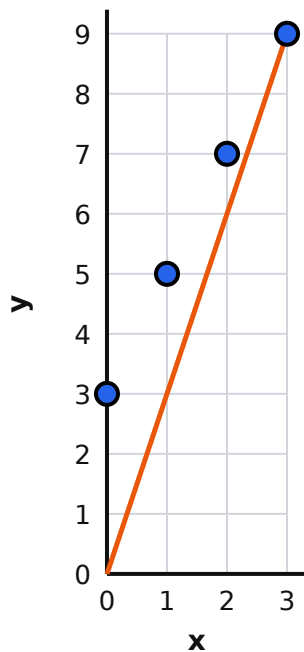
The graph shows a straight line through the points shown. Is the relationship proportional? If so, find the constant of proportionality.



A line drawn through the plotted points.

Problem 8: Graph that misses the origin

Explain why this graph does not show a proportional relationship.



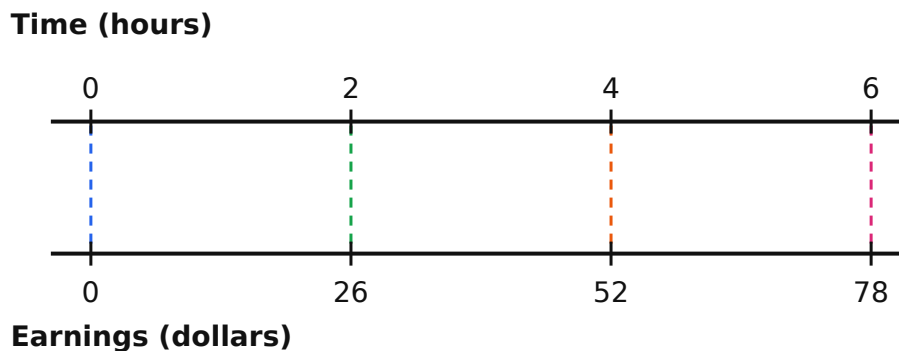
A straight line that crosses the y-axis at 3.

Problem 9: Miles per gallon

A car travels 150 miles on 6 gallons of gas and 225 miles on 9 gallons. Is the distance proportional to the gas used? Find the constant of proportionality with units.

Problem 10: Earnings number line

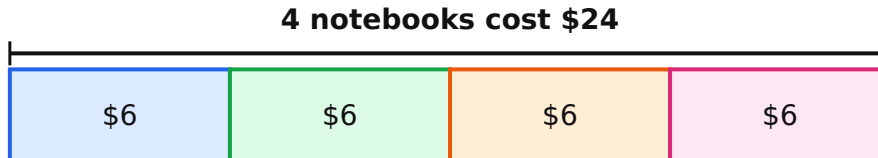
The double number line shows the money Aisha earns for babysitting. Decide whether the earnings are proportional to the hours. Find the constant of proportionality and the earnings for 10 hours.



Hours and earnings.

Problem 11: Notebook bar model

The bar model shows the total cost of 4 notebooks. Find the constant of proportionality (the price of one notebook), then find the cost of 7 notebooks.

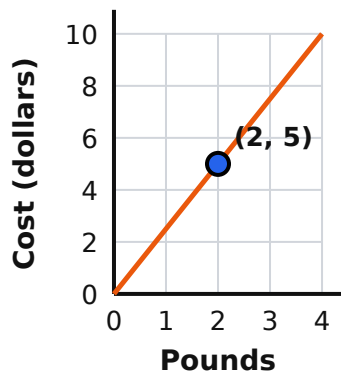


Four equal parts make \$24.

Problem 12: Meaning of the points

The graph of the cost y in dollars of x pounds of grapes is a straight line through the origin and the point $(2,5)$.

- Find the constant of proportionality.
- Write the coordinates of the point with $x=1$ and explain what it means.
- Explain what the point $(0,0)$ means.

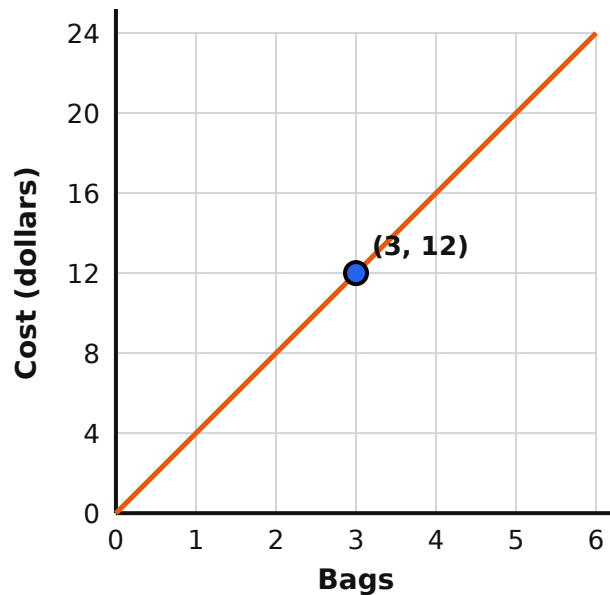


Cost of grapes in dollars.

Problem 13: Points on a graph

The graph of the cost y , in dollars, of x bags of oranges is a straight line through the origin and the point $(3,12)$.

- Find the constant of proportionality.
- Write the coordinates of the point with $x=1$ and explain what it means.
- Write the coordinates of the point with $x=5$ and explain what it means.



Cost of bags of oranges in dollars.

Problem 14: Missing table values

The table shows a proportional relationship. Find the constant of proportionality and the two missing values.

x	2	4	6	10
y	9	?	27	?

Problem 15: Two gym plans

Two gyms charge for months of membership. Decide whether the total cost is proportional to the number of months at each gym. Justify each answer.

Months	1	2	3	4
Gym A	60	120	180	240
Gym B	85	110	135	160

Total cost in dollars for 1 to 4 months.

Problem 16: Three riders

Liam, Sofia, and Noah each biked at a steady pace. The table shows the miles they traveled.

Hours	1	2	3
Liam (miles)	5	10	15
Sofia (miles)	6	11	16
Noah (miles)	4.5	9	13.5

Miles biked after 1, 2, and 3 hours.

- Decide whose distance is proportional to the time.
- For each proportional relationship, find the constant of proportionality.
- Decide who bikes faster among the proportional riders, and by how much.

Problem 17: Bake sale table

Priya sold cupcakes at a bake sale. The table shows the money she collected.

Cupcakes	3	5	8	12
Money (dollars)	7.50	12.50	20.00	30.00

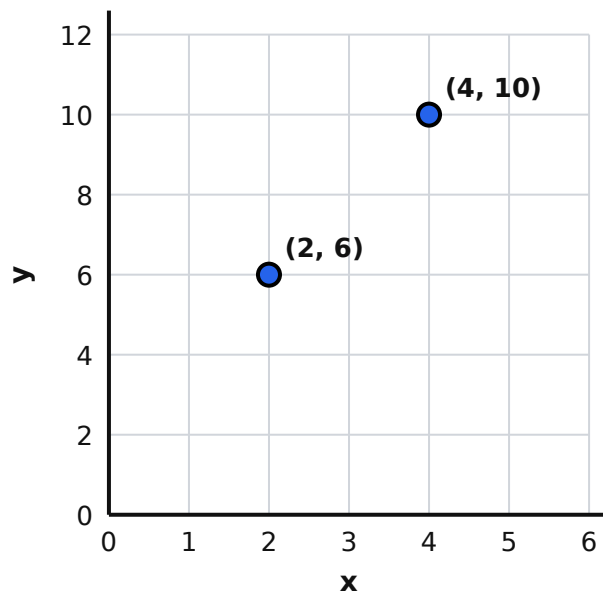
- Show that the money is proportional to the number of cupcakes and find k .
- How much money will she collect for 20 cupcakes?

Cupcakes	3	5	8	12
Money (dollars)	7.50	12.50	20.00	30.00

The bake sale data.

Problem 18: Straight line error

Ethan says, "The points $(2,6)$ and $(4,10)$ lie on a straight line, so the relationship is proportional." Explain why Ethan is incorrect.



Two points on a straight line.

Problem 19: Find the error

Liam looked at the table below and said, "The y -values go up by 4 each time, so this is proportional." Is Liam correct? Explain.

x	0	2	4	6
y	5	9	13	17

Problem 20: Cheese at two stores

At Store A, 4 pounds of cheddar cheese cost \$26.00. At Store B, 5 pounds of the same cheese cost \$31.25. At both stores the cost is proportional to the weight.

- Find the constant of proportionality for each store.
- Decide which store charges less per pound, and by how much.
- Find how much a deli saves on 12 pounds by shopping at the cheaper store.