

Grade 7 - Proportional Relationships and $y = kx$ - Answer Key

Common Core 7.RP.A.2 · maths-pdf.fr/en/

Use this answer key to check your work on the proportional relationships worksheet. Every solution shows the steps, and the final answer appears in bold. If your answer is different, compare each step and look for the first place where the work changes.

Grade 7 · Common Core State Standards: **7.RP.A.2**

Exercise 1 - Is it proportional?

Divide y by x : $3 \div 1 = 3$, $6 \div 2 = 3$, $9 \div 3 = 3$, $12 \div 4 = 3$.

All ratios are equal.

Yes, $k = 3$

Exercise 2 - Not proportional

Ratios: $5 \div 2 = 2.5$, $9 \div 4 = 2.25$, $13 \div 6 \approx 2.17$.

The ratios are not equal.

No, the ratios change

Exercise 3 - Find k

$$k = y \div x = 10 \div 4 = 2.5$$

$k = 2.5$

Exercise 4 - Write an equation

The unit rate is the constant of proportionality: $k = 3.75$.

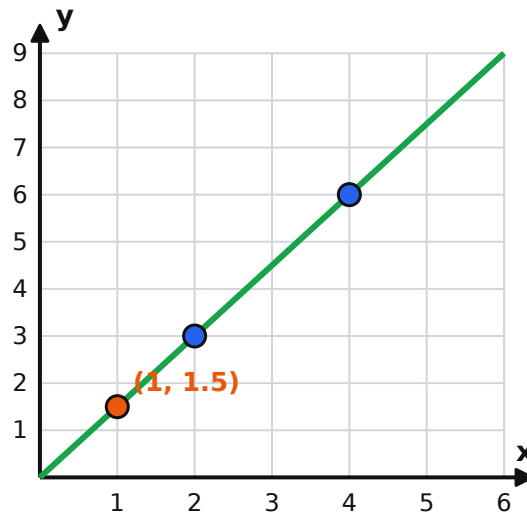
$$y = 3.75x$$

Exercise 5 - Read a graph

The graph is a straight line through the origin, so it is proportional.

Use the point (2, 3): $k = 3 \div 2 = 1.5$. Check (4, 6): $6 \div 4 = 1.5$.

Yes, $k = 1.5$



The point (1, 1.5) shows the unit rate.

Exercise 6 - Line that misses the origin

The points lie on a line, but the line crosses the y-axis at 1, not at the origin.

Also $3 \div 2 = 1.5$ and $5 \div 4 = 1.25$ are different.

No, the line does not pass through (0, 0)

Exercise 7 - Fractions in a table

$\frac{3}{4} \div \frac{1}{2} = \frac{3}{4} \times 2 = \frac{3}{2}$. Check: $1\frac{1}{2} \div 1 = \frac{3}{2}$ and $3 \div 2 = \frac{3}{2}$.

$k = \frac{3}{2}$

Exercise 8 - Complete the table

$y = 4.5x$: $4.5 \times 2 = 9$, $4.5 \times 5 = 22.5$, $4.5 \times 8 = 36$.

9, 22.5, 36

Exercise 9 - Use the equation

$$y = 0.8 \times 15 = 12.$$

For $y = 20$: $20 = 0.8x$, so $x = 20 \div 0.8 = 25$.

$y = 12$; $x = 25$

Exercise 10 - Unit rate on a graph

$$k = 12 \div 3 = 4, \text{ so the point is } (1, 4).$$

The y-value 4 is the unit rate.

$(1, 4)$; the unit rate is 4

Exercise 11 - Meaning of a point

$$k = 65 \div 5 = 13, \text{ so } y = 13x.$$

The point $(1, 13)$ means \$13 is earned in 1 hour.

$y = 13x$; \$13 per hour

Exercise 12 - Which plan is proportional?

With 0 visits Plan A costs $12 \times 0 = 0$ dollars, so its graph goes through the origin.

Plan B costs \$30 with 0 visits, so it does not.

Plan A

Exercise 13 - Write the equation from a table

$$1.40 \div 8 = 0.175, 2.10 \div 12 = 0.175, 3.50 \div 20 = 0.175.$$

$$y = 0.175x$$

Ounces x	8	12	20
y / x	0.175	0.175	0.175

Every ratio is 0.175.

Exercise 14 - Find a missing point

$$k = 15 \div 6 = 2.5.$$

$$a = 2.5 \times 10 = 25.$$

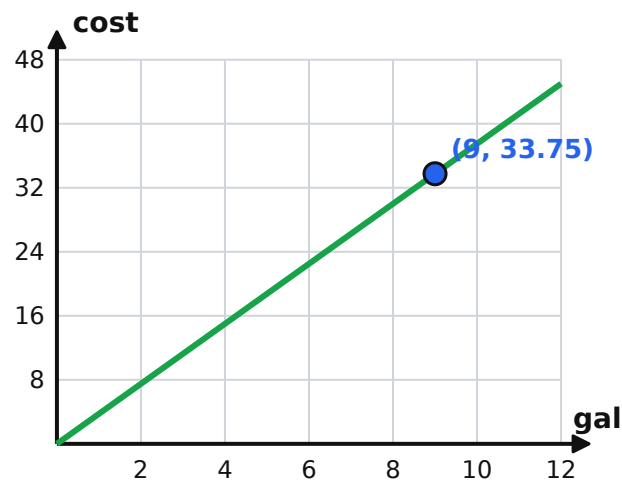
$$a = 25$$

Exercise 15 - Gas station

$$k = 45 \div 12 = 3.75, \text{ so } c = 3.75g.$$

$$3.75 \times 9 = 33.75.$$

$$c = 3.75g; \text{ \$33.75}$$



9 gallons cost \$33.75.

Exercise 16 - Pancake batches

$$k = 3 \div 2 = 1.5, \text{ so } y = 1.5x.$$

$$1.5 \times 7 = 10.5.$$

$$y = 1.5x; \text{ 10.5 cups}$$

Exercise 17 - Two bike riders

Rider B: $5 \div \frac{1}{2} = 10$, $10.5 \div 1 = 10.5$, $21 \div 2 = 10.5$. The first ratio is different.

After 2 hours Rider A has gone $10 \times 2 = 20$ miles and Rider B 21 miles.

Not proportional; Rider B is ahead by 1 mile

Exercise 18 - Concert tickets

$$k = 52 \div 8 = 6.5, \text{ so } y = 6.5x.$$

$$97.5 = 6.5x, \text{ so } x = 97.5 \div 6.5 = 15.$$

$$y = 6.5x; \text{ 15 tickets}$$

Hours x	1/2	1	2
y / x	10	10.5	10.5

The ratios are not all equal.

Exercise 19 - Plant growth

On day 0 the height is 4 inches, not 0, so the graph does not pass through the origin.

Also $6 \div 2 = 3$ and $8 \div 4 = 2$ are different.

No

Exercise 20 - Two printers

$$\text{A: } 45 \div 1.5 = 30, \text{ so } p = 30t. \text{ B: } p = 35t.$$

In 4 minutes: A prints $30 \times 4 = 120$, B prints $35 \times 4 = 140$.

$$140 - 120 = 20$$

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