

Grade 7 · Equations of Proportional Relationships · Test Answer Key

Common Core 7.RP.A.2c · mathovore.fr

Complete solutions and scoring guide for the 20-point test on equations of proportional relationships. Award each point as described; give partial credit when a method is correct but an arithmetic slip appears. Total score is the sum of all question scores, out of 20.

Grade 7 Common Core: 7.RP.A.2c

Question 1: Constant from a table (2 points)

$$\frac{18}{4} = 4.5, \frac{36}{8} = 4.5, \frac{54}{12} = 4.5.$$

x	4	8	12
y	18	36	54
y/x	4.5	4.5	4.5

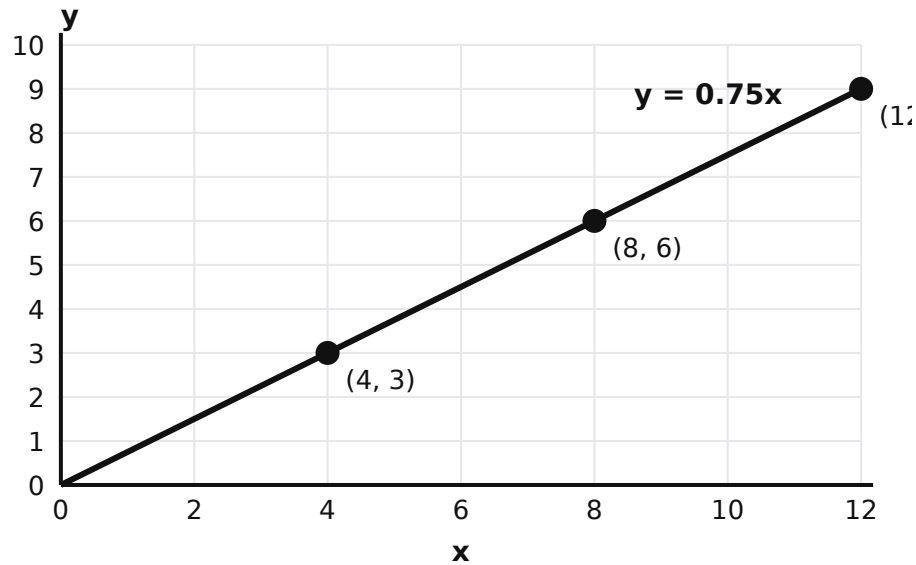
Every ratio is 4.5.

- a. $k = 4.5$
- b. $y = 4.5x$

Scoring: 1 point for the correct constant (a); 1 point for the correct equation (b). Accept $y = \frac{9}{2}x$.

Question 2: Equation from a graph (2 points)

Use the point (4,3): $k = \frac{3}{4} = 0.75$. Check: $\frac{6}{8} = 0.75$ and $\frac{9}{12} = 0.75$.



The line is $y = 0.75x$.

- a. $k = 0.75$
- b. $y = 0.75x$

Scoring: 1 point for k (accept $\frac{3}{4}$); 1 point for the equation.

Question 3: Notebooks (2 points)

- a. $t = 1.85n$
- b. $t = 1.85 \times 12 = 22.2$, so the cost is \$22.20.

Scoring: 1 point for the equation; 1 point for \$22.20 (with the unit or dollar sign).

Question 4: Two tables (3 points)

Table A: $\frac{7}{2} = 3.5$, $\frac{14}{4} = 3.5$, $\frac{21}{6} = 3.5$. Table B: $\frac{4}{1} = 4$, $\frac{7}{2} = 3.5$, $\frac{10}{3} \approx 3.33$.

Table A

x	2	4	6
y	7	14	21
y/x	3.5	3.5	3.5

Table B

x	1	2	3
y	4	7	10
y/x	4	3.5	3.33

Ratios of y to x for both tables.

- a. Table A is proportional (all ratios equal 3.5). Table B is not proportional (the ratios 4, 3.5 and 3.33 differ).
- b. $y = 3.5x$

Scoring: 1 point for each correct decision with a justification using ratios (2 points in all); 1 point for $y = 3.5x$.

Question 5: Hourly pay (2 points)

- a. $p = 13.5 \times 18 = 243$, so \$243.00.
- b. $202.5 = 13.5h$, so $h = 202.5 \div 13.5 = 15$ hours. Check: $13.5 \times 15 = 202.5$.

Scoring: 1 point for \$243; 1 point for 15 hours.

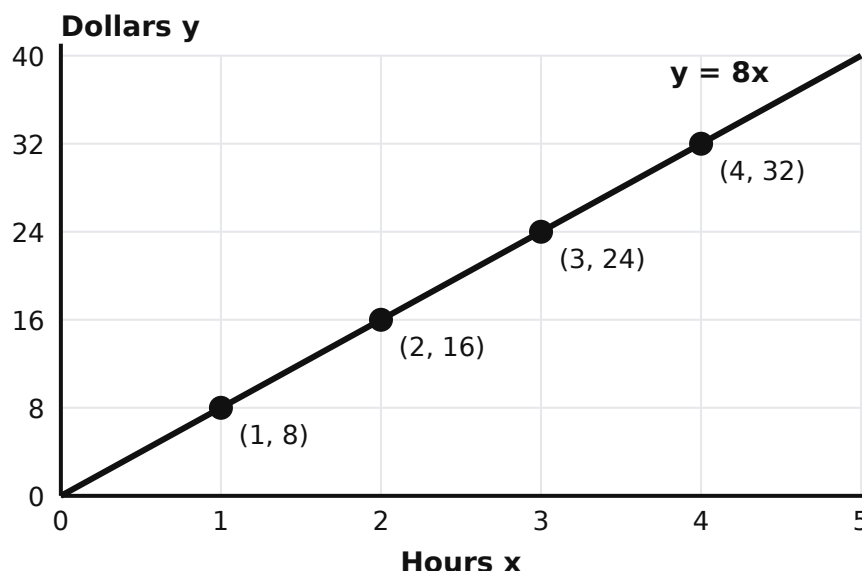
Question 6: Two printers (3 points)

- a. $\frac{40}{2} = 20$, $\frac{100}{5} = 20$, $\frac{160}{8} = 20$, so $p = 20m$.
- b. Printer A prints 18 pages per minute and Printer B prints 20, so Printer B is faster.
- c. In 15 minutes: A prints $18 \times 15 = 270$ pages and B prints $20 \times 15 = 300$ pages. B prints 30 more pages.

Scoring: 1 point for the equation; 1 point for comparing 18 with 20 and naming Printer B; 1 point for 30 pages.

Question 7: Dog walking (3 points)

Use the point (3,24): $k = \frac{24}{3} = 8$.



Ethan's line is $y = 8x$.

- a. $y = 8x$
- b. The point (1,8) means Ethan earns \$8 for 1 hour of dog walking, which is the unit rate.
- c. Ethan: $8 \times 6 = 48$. Mei: $7.5 \times 6 = 45$. Ethan earns \$3 more.

Scoring: 1 point for the equation; 1 point for stating \$8 per hour; 1 point for Ethan earning \$3 more.

Question 8: Filling a tank (3 points)

- a. $k = \frac{30}{8} = 3.75$, so $g = 3.75m$.
- b. $3.75 \times 25 = 93.75$ gallons.
- c. $150 = 3.75m$, so $m = 150 \div 3.75 = 40$ minutes.

Scoring: 1 point for the equation; 1 point for 93.75 gallons; 1 point for 40 minutes.

Total
20 points