

Grade 8 · Proportional Relationships and Slope

· Test Answer Key

Common Core 8.EE.B.5, 8.EE.B.6 · mathovore.fr

Use this key to score the test out of 20 points. Each solution shows the full work, and the scoring note explains the partial credit. Accept any correct method, equivalent fractions and decimals, and any correct pair of points on a graph.

Grade 8 Common Core: 8.EE.B.5 · 8.EE.B.6

Question 1: Unit rate from a table (2 points)

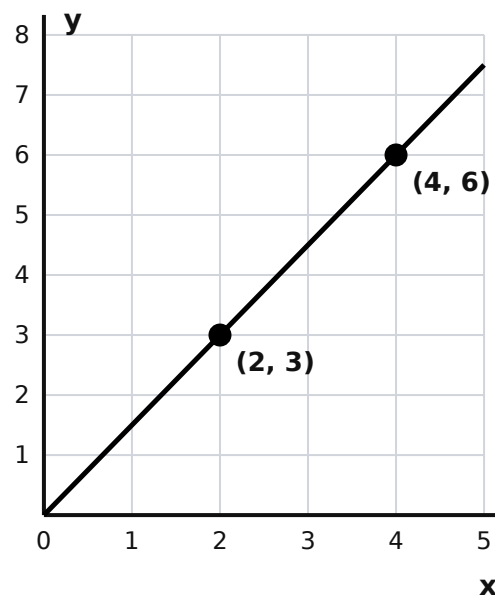
Unit rate: $\frac{13.50}{3} = 4.50$, $\frac{22.50}{5} = 4.50$, $\frac{36}{8} = 4.50$. Equation: $y = 4.5x$.

For 11 pounds: $4.5(11) = 49.5$, so the cost is **\$49.50**.

Scoring: 1 point for the unit rate and equation; 1 point for the correct cost with the dollar sign.

Question 2: Graph a proportional equation (3 points)

- For $x=2$, $y=3$; for $x=4$, $y=6$. Points $(2,3)$ and $(4,6)$ (also $(0,0)$).
- Draw a straight line through the plotted points and the origin.
- The slope is $\frac{3}{2}$.



The graph of $y = \frac{3}{2}x$.

Scoring: 1 point for two correct points, 1 point for a straight line through the origin, 1 point for slope $\frac{3}{2}$ (accept 1.5).

Question 3: Slope and equation from a graph (2 points)

The line passes through the origin and (5,4): slope = $\frac{4}{5}$.

Equation: $y = \frac{4}{5}x$ (or $y = 0.8x$).

Scoring: 1 point for slope 4/5; 1 point for the equation.

Question 4: Similar triangles and slope (3 points)

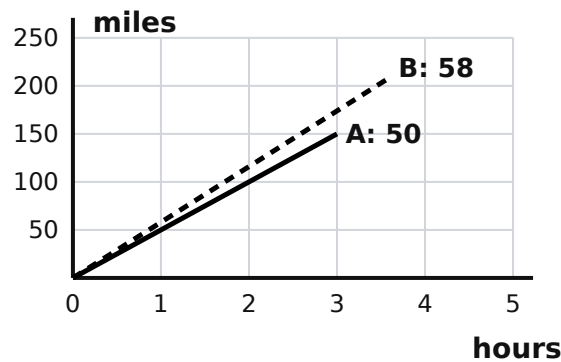
- a. The run grows from 4 to 12, which is 3 times larger, so the rise is $3 \times 3 = 9$. **Rise = 9.**
- b. Both triangles have a right angle and share the angle at the origin, so they are similar. In similar triangles the ratios of corresponding sides are equal, so $\frac{3}{4} = \frac{9}{12}$. The slope is $\frac{3}{4}$ in both.

Scoring: 1 point for rise 9; 1 point for stating the triangles are similar; 1 point for concluding that rise over run is equal.

Question 5: Compare two speeds (3 points)

Car A: $\frac{150}{3} = 50$ miles per hour. Car B: slope 58 miles per hour.

Since $58 > 50$, **Car B is faster, by 8 miles per hour.**



Car B is steeper, so it is faster.

Scoring: 1 point for Car A's rate 50; 1 point for Car B's rate 58 and the comparison; 1 point for the difference of 8.

Question 6: Slope and intercept (2 points)

Slope: $-\frac{3}{4}$. y -intercept: **6**.

It is not proportional, because the y -intercept is 6, not 0, so the line does not pass through the origin.

Scoring: 1 point for the slope and intercept; 1 point for the answer not proportional with a reason.

Question 7: Points to an equation (2 points)

$$\text{Slope} = \frac{-3-5}{1-(-3)} = \frac{-8}{4} = -2.$$

Use $(1, -3)$: $-3 = -2(1) + b$, so $b = -1$. Equation: $y = -2x - 1$. Check with $(-3, 5)$: $-2(-3) - 1 = 5$.

Scoring: 1 point for slope -2; 1 point for the equation with $b = -1$.

Question 8: Streaming plan (3 points)

- a. $y = 3x + 5$.
- b. $3(9) + 5 = 32$. The cost is **\$32**.
- c. $3x + 5 = 41$, so $3x = 36$ and $x = 12$. She rented **12 movies**.

Scoring: 1 point per part.

Total
20 points