

Grade 8 · Proportional Relationships and Slope

· Worksheet

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

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

These twenty-two problems practice Common Core standards 8.EE.B.5 and 8.EE.B.6. Graph proportional relationships, find unit rates and slopes, and compare relationships shown in tables, graphs, equations and words.

Later problems use similar triangles to explain slope and write equations of the form $y = mx + b$. The last six are word problems that need an equation or a comparison.

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

Problem 1: Constant from a table

The table shows the distance a train travels. Find the constant of proportionality and write an equation $y = mx$.

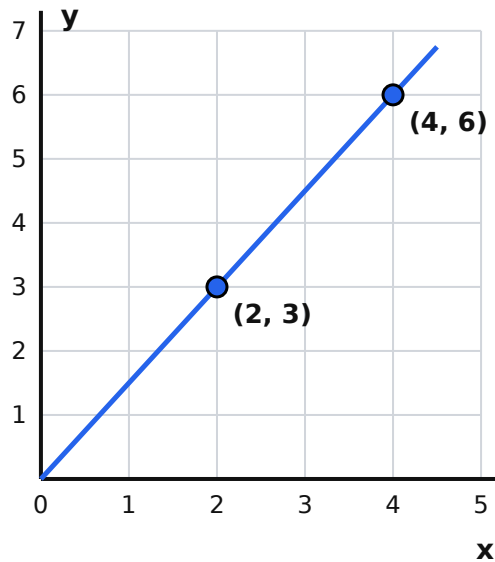
Time (hours)	2	4	6
Distance (miles)	110	220	330

Problem 2: Equation from a price

At the school store, 4 cupcakes cost \$10. Write an equation for the cost y of x cupcakes. Then find the cost of 14 cupcakes.

Problem 3: Slope from a graph

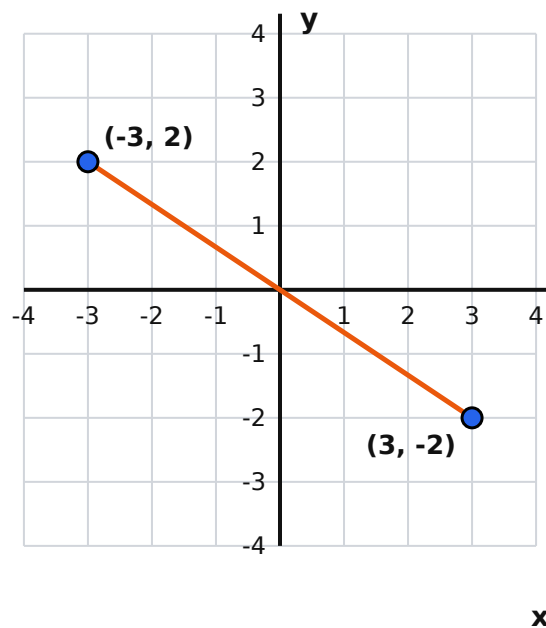
Find the slope of the line and write its equation.



The line passes through the origin.

Problem 4: Negative slope

Find the slope of the line. Then write its equation.



The line falls from left to right.

Problem 5: Graph $y = mx$

Complete the table of values for $y = \frac{3}{4}x$ when $x = 0, 4$ and 8 . Then graph the line.

Problem 6: Slope and intercept

Name the slope and the y -intercept of each equation.

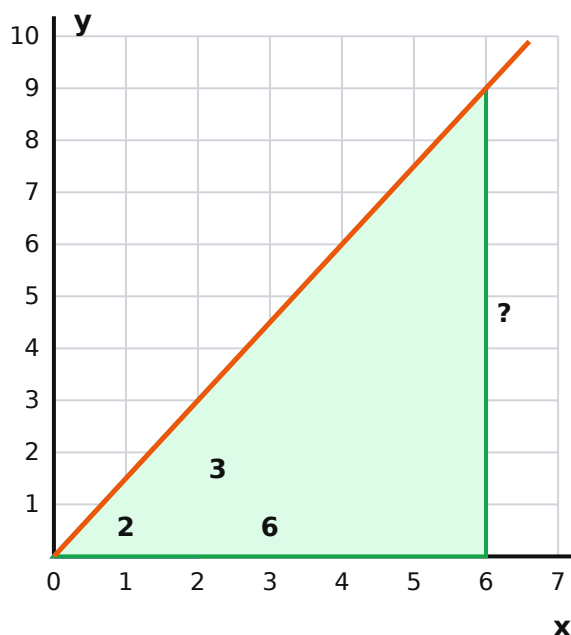
- a. $y = -2x + 5$
- b. $y = \frac{1}{3}x - 4$
- c. $y = 4x$

Problem 7: Graph $y = mx + b$

Graph $y = 2x + 1$. Start at the y -intercept and use the slope to find two more points.

Problem 8: Similar triangles

The small triangle has run 2 and rise 3. The large triangle has run 6. Find the rise of the large triangle, and explain why both triangles give the same slope.



Two right triangles under the same line.

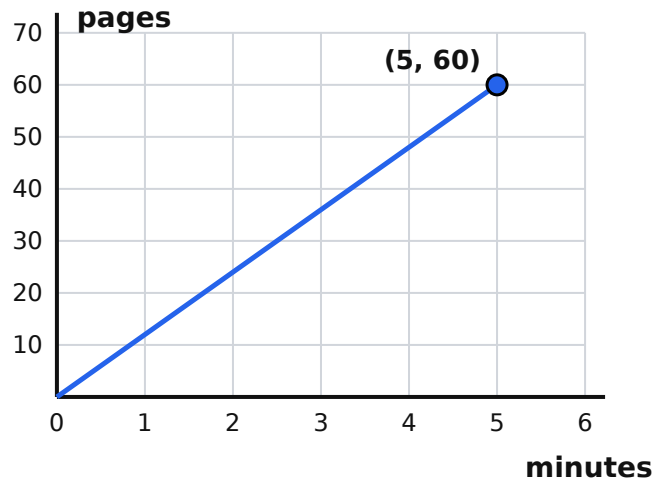
Problem 9: Table versus equation

Bike A follows $y = 12x$, where y is miles after x hours. Bike B is shown in the table. Which bike is faster?

Time (hours)	2	3	5
Distance (miles)	28	42	70

Problem 10: Graph versus equation

The graph shows the pages printed by Printer A. Printer B prints pages by $y = 15x$, where x is minutes. Which printer is faster, and by how many pages per minute?



Printer A: pages printed over time.

Problem 11: Compare with words

Noah's hose fills 18 gallons in 4 minutes. Sofia's hose is shown in the table. Whose hose fills faster, and by how much?

Time (min)	2	3	5
Water (gal)	8.4	12.6	21

Problem 12: Slope from two points

A line passes through $(1,3)$ and $(5,11)$. Find the slope, then write the equation in the form $y = mx + b$.

Problem 13: Slope with negatives

Find the slope of the line through $(-2,4)$ and $(3,-6)$.

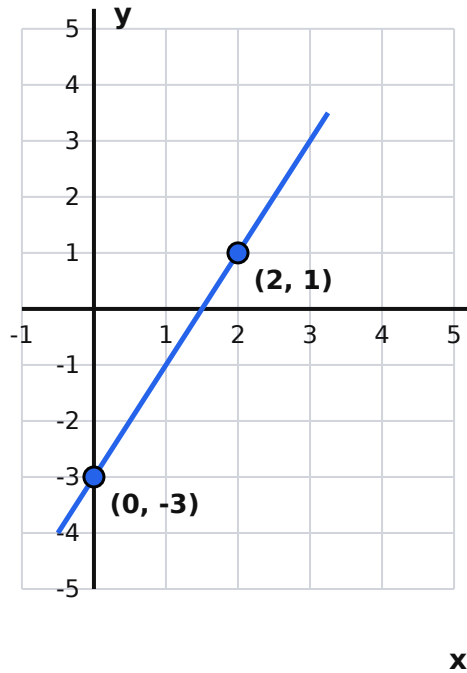
Problem 14: Proportional or not

Decide whether the table shows a proportional relationship. If not, write an equation for it.

x	0	1	2	3
y	2	5	8	11

Problem 15: Equation from a graph

Write the equation of the line in the form $y = mx + b$.



A line that crosses the y-axis below the origin.

Problem 16: Missing coordinate

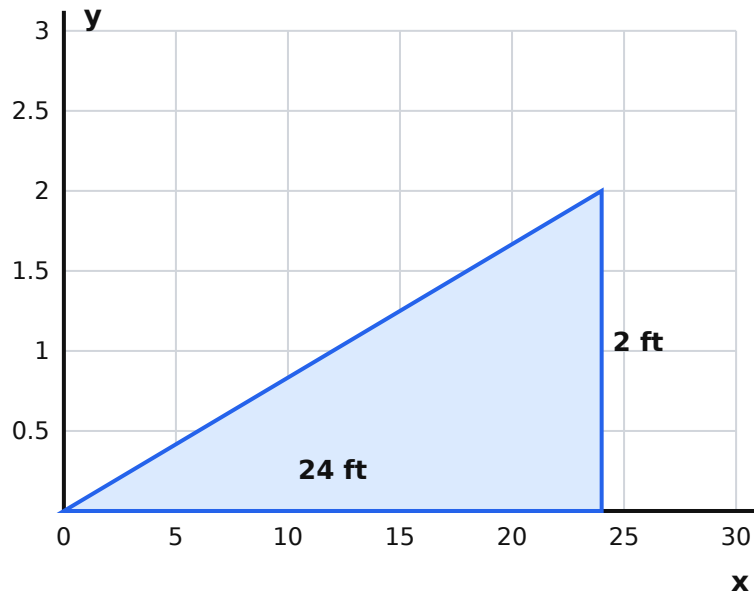
A proportional relationship passes through $(6,9)$. Find y when $x = 10$, and find x when $y = 21$.

Problem 17: Taxi fare

A taxi charges a \$3 flat fee plus \$2 for each mile. Write an equation for the cost y of an x -mile ride, name the slope and y -intercept, and find the cost of a 7-mile ride.

Problem 18: Ramp rise

A ramp rises 2 feet over a horizontal run of 24 feet. A second ramp has the same slope and a run of 30 feet. Find the rise of the second ramp.



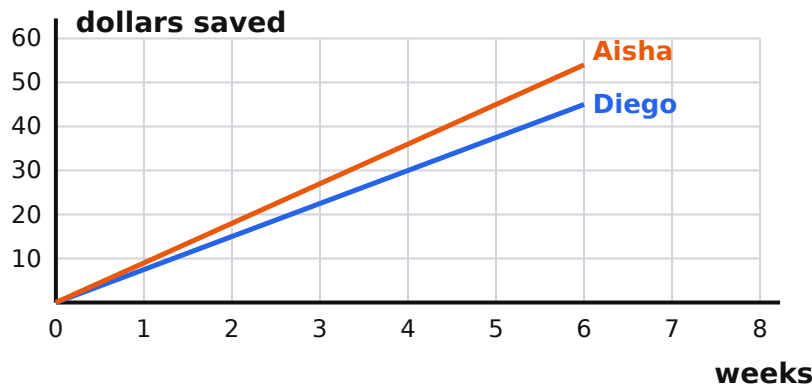
The first ramp.

Problem 19: Gym plans

Gym A charges a \$20 sign-up fee plus \$5 per visit. Gym B charges \$9 per visit with no fee. Write an equation for each, find each cost for 10 visits, and tell which plan is a proportional relationship.

Problem 20: Savings race

The graph shows how much Diego and Aisha save. Write an equation for each person and find how much more Aisha saves per week than Diego.



Savings of Diego and Aisha.

Problem 21: Savings with a start

Mei's savings account had \$50 after 2 weeks and \$90 after 6 weeks, and it grows at a constant rate. Find the weekly rate, write an equation, and tell how much she started with. Is the relationship proportional?

Problem 22: Draining a tank

A tank holds 120 gallons. It drains at a constant rate of 8 gallons per minute. Write an equation for the water y left after x minutes, name the slope and y -intercept, and find when the tank is empty.