

Line Meeting Point

Graph two lines to find their shared solution.

GRADE 8 • MA.8.AR.4.3

MA.8.AR.4.3 "Given a mathematical or real-world context, solve systems of two linear equations by graphing."

NAME _____

DATE _____

FIND THE INTERSECTION

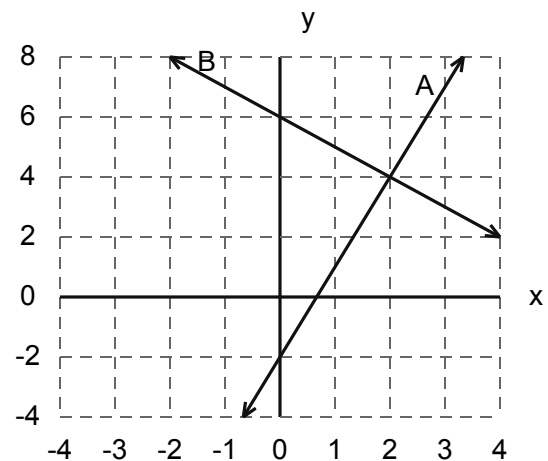
Plot two points for each slope-intercept equation, then draw both lines on the same grid. Their shared point satisfies both equations. Estimate between grid lines when needed. Equal slopes with different intercepts give parallel lines and no solution. Label the lines; check your intersection in both equations. Use a ruler.

WORKED EXAMPLE

Graph A: $y = 3x - 2$ and B: $y = -x + 6$. Find their intersection.

1. For A, plot $(0, -2)$ and $(2, 4)$. For B, plot $(0, 6)$ and $(2, 4)$.
2. Draw the two lines. They cross at $(2, 4)$.
3. Check: $3(2) - 2 = 4$ and $-2 + 6 = 4$.

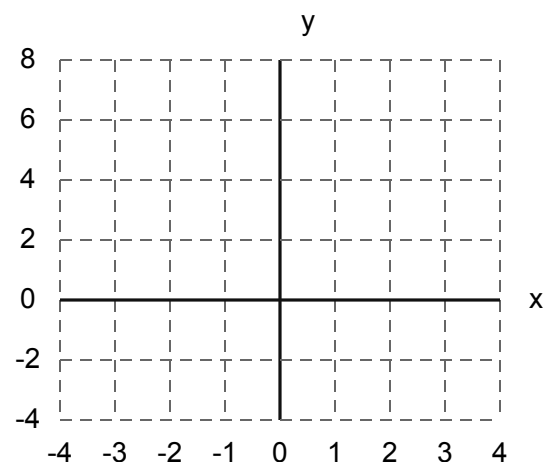
Answer: One solution: $(2, 4)$.



PRACTICE 4 problems

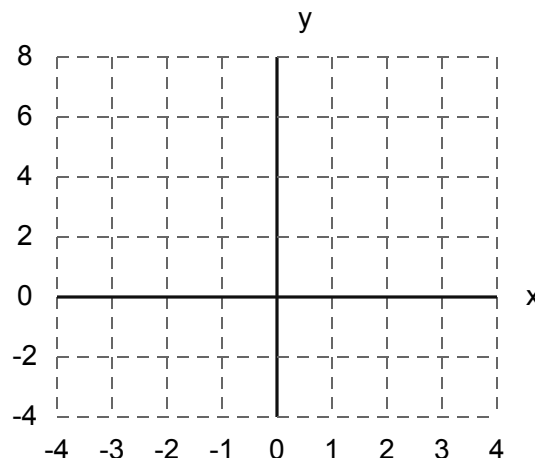
- 1 Graph both equations on the supplied grid and state the solution. A: $y = x + 2$; B: $y = -x + 6$.

ANSWER _____



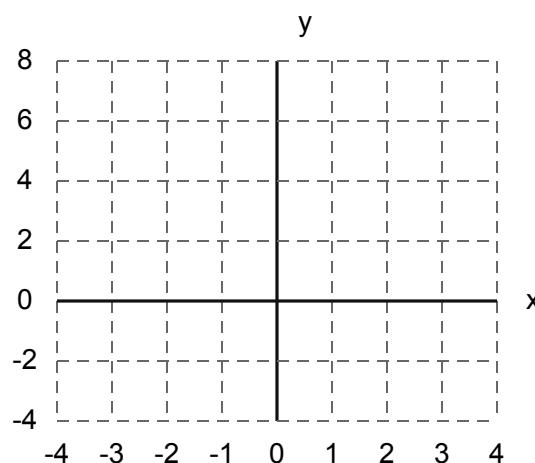
- 2** Graph both equations on the supplied grid and state the solution. A: $y = 2x - 1$; B: $y = -x + 4$. Estimate the intersection to the nearest tenth.

ANSWER _____



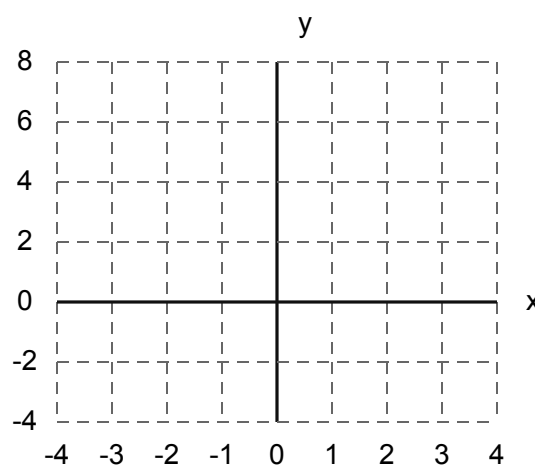
- 3** Graph both equations on the supplied grid and state the solution. A: $y = -2x + 7$; B: $y = x - 2$.

ANSWER _____



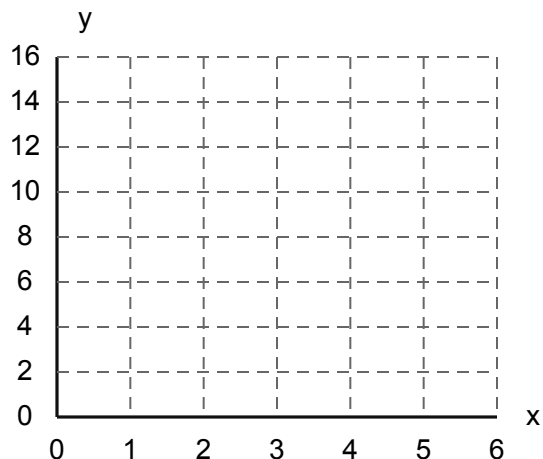
- 4** Graph both equations on the supplied grid and state the solution. A: $y = 2x + 4$; B: $y = 2x - 3$. Explain whether there is an intersection.

ANSWER _____

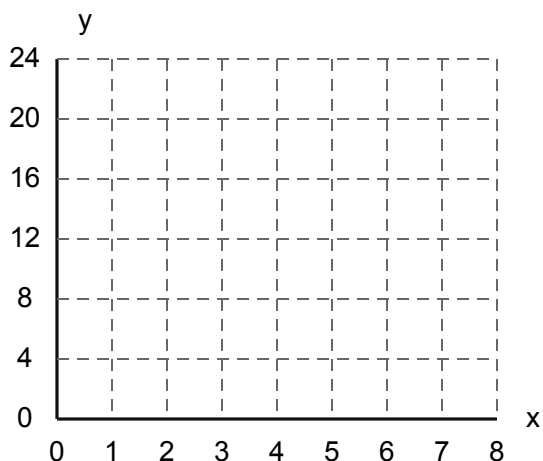


APPLY IT Show your work**1**

A music app charges either Plan A: \$2 plus \$2 per month, or Plan B: \$6 plus \$1 per month. Let x be months and y be dollars. Write and graph both equations. When do the costs match?

**2**

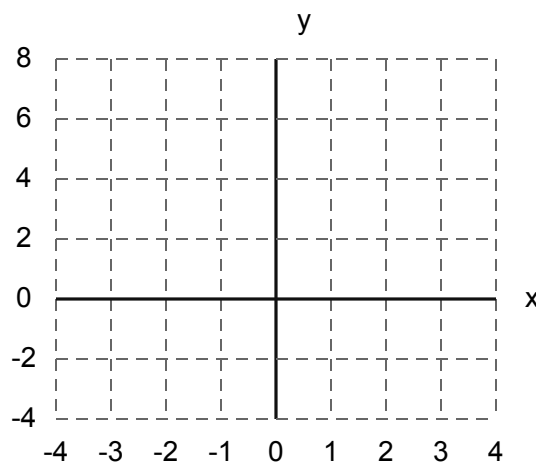
Two cyclists have traveled 2 km and 8 km when the timer starts. Their distances then increase by 3 km and 2 km each hour, respectively. Let x be hours and y be total km. Write and graph both models. When do their distances match?



CHALLENGE One step up

Graph $y = x/2 + 1$ and $y = 3 - x/2$. A student says the solution is (2,3). Use the graph and substitution to evaluate that claim.

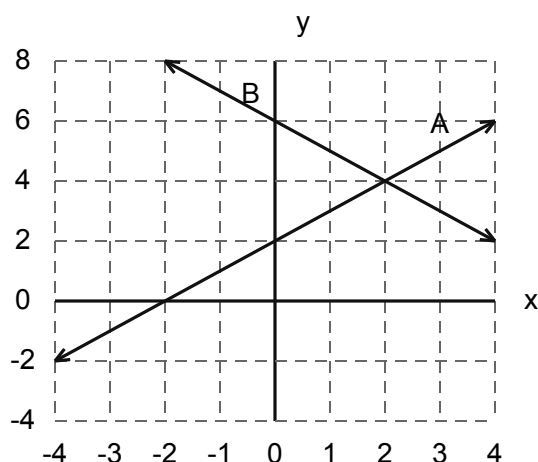
WORK SPACE AND ANSWER



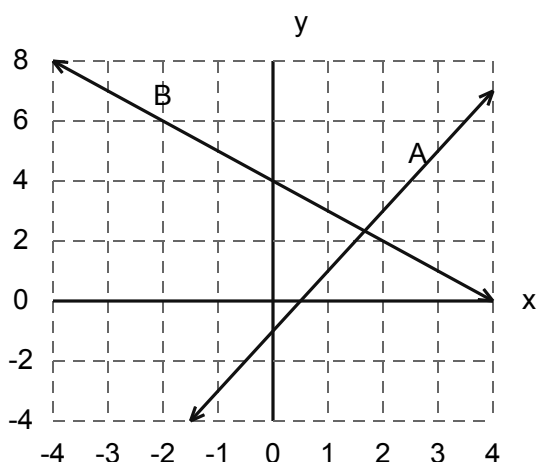
Require two graphed lines and an intersection or graphical reason for no solution. Accept small drawing/reading errors for the noninteger result; the exact fractions are a teacher check. Interpret contextual intersections with both units. Contextual x values are nonnegative; month payments occur at whole months.

PRACTICE 1

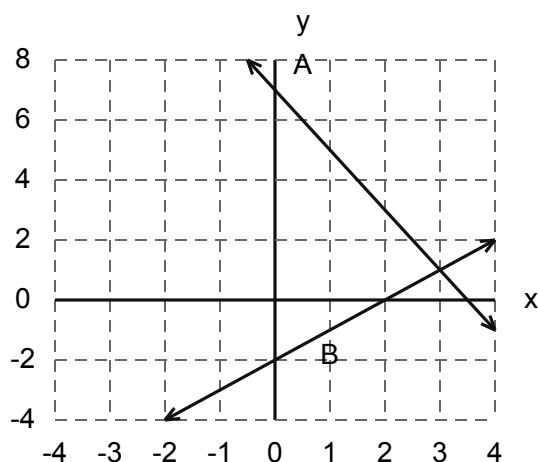
(2,4). Both equations give $y = 4$ when $x = 2$.

**PRACTICE 2**

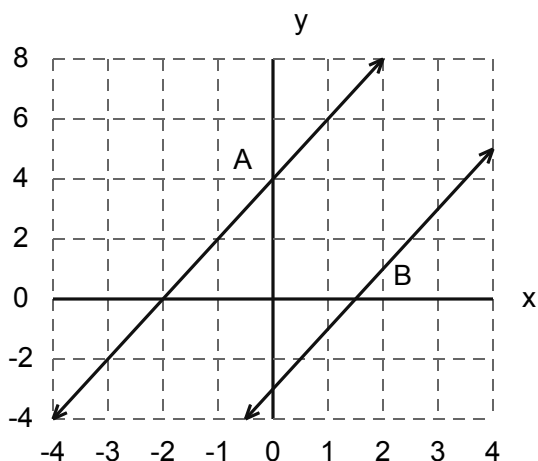
Approximately (1.7, 2.3); exact point $(5/3, 7/3)$.

**PRACTICE 3**

(3,1). Both equations give $y = 1$ when $x = 3$.

**PRACTICE 4**

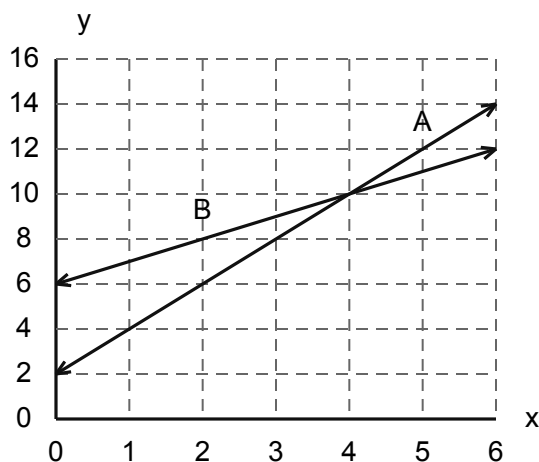
No solution. Both slopes are 2, but the intercepts differ.



APPLY IT 1

A: $y = 2x + 2$; B: $y = x + 6$. At $(4, 10)$, both cost \$10 after 4 months.

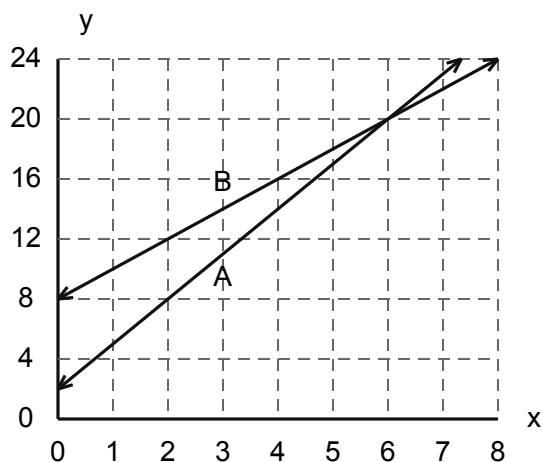
Fixed fees give intercepts; monthly charges give slopes.



APPLY IT 2

A: $y = 3x + 2$; B: $y = 2x + 8$. They match after 6 hours, at 20 km.

Compare total distances at the same elapsed time.



CHALLENGE

The solution is $(2, 2)$, not $(2, 3)$. Both equations give 2 when $x = 2$.

