LESSON MAKER PRO

Points to Graphs

Find every solution, not just a few.

HIGH SCHOOL · A1P.AF.E.14

A1P.AF.E.14 "Given a relation defined by an equation in two variables, identify the graph of the relation as the set of all its solutions plotted in the coordinate plane."

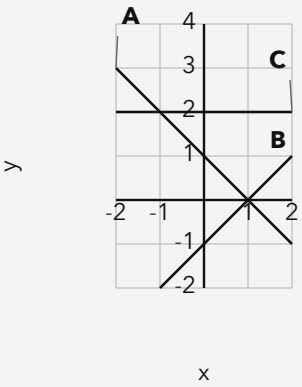
NAME _____ DATE _____

THE BIG IDEA

A point is on the graph of an equation when its coordinates make the equation true. The whole graph contains every solution point, not just the points you test.

WORKED EXAMPLE

Which labeled line graphs $y = -x + 1$?



1. Set x = 0. Then y = 1.
2. Set x = 1. Then y = 0.
3. A passes through both points and has slope -1.

Answer: A

PRACTICE 4 problems

1 Give two points on $y = 3x - 4$. What kind of graph contains all its solutions?

ANSWER _____

2 Give two points on $x = 6$. Is its graph horizontal or vertical?

ANSWER _____

3 Give two points on $y = 7$. Is its graph horizontal or vertical?

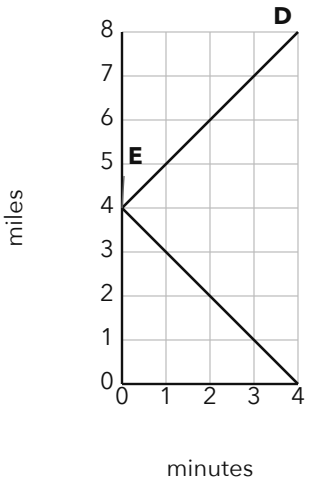
ANSWER _____

4 Which points lie on $x^2 + y^2 = 25$: (3, 4), (5, 5), or (0, -5)?

ANSWER _____

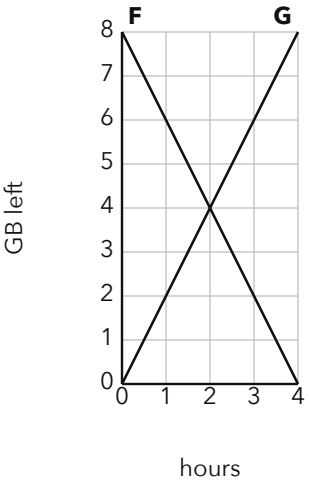
APPLY IT Show your work

1 A scooter has 4 miles of range and gains 1 mile per minute while charging. Let x be minutes and y be miles of range. Which labeled graph shows y = x + 4?



ANSWER _____

2 A game download has 8 GB left. Each hour, 2 GB downloads. Let x be hours and y be GB left. Which labeled graph shows y = 8 - 2x?



ANSWER _____

CHALLENGE One step up

A student plots only (-2, 0), (0, -4), and (2, 0) for $y = x^2 - 4$. Is that the whole graph? Explain with one more solution point.

WORK SPACE AND ANSWER

ANSWER KEY

Points to Graphs

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Give two points on y = 3x - 4. What kind of graph contains all its solutions?	**(0, -4) and (2, 2); a line.**
2	Give two points on x = 6. Is its graph horizontal or vertical?	**(6, 0) and (6, 5); vertical.**
3	Give two points on y = 7. Is its graph horizontal or vertical?	**(0, 7) and (4, 7); horizontal.**
4	Which points lie on $x^2 + y^2 = 25$: (3, 4), (5, 5), or (0, -5)?	**(3, 4) and (0, -5)**

PART 2 · APPLY IT

1. **D** At x = 2, the equation gives y = 6. D passes through (2, 6) and has the required slope.
2. **F** At x = 0, 8 GB remain. F starts at (0, 8) and decreases by 2 GB per hour.

CHALLENGE

No. (1, -3) is another solution because $1^2 - 4 = -3$. The graph includes every solution point.

Accept any valid pair of distinct points in the first three problems. For the challenge, accept any additional solution point with a correct check.