LESSON MAKER PRO

Find the Line

Write linear equations from clues, data, and real situations.

HIGH SCHOOL · A1.A.4.3

A1.A.4.3 "Write the equation of the line given its slope and y-intercept, slope and one point, two points, x- and y-intercepts, or a set of data points."

NAME _____ DATE _____

SLOPE AND STARTING VALUE

A line with slope m and y-intercept b has the equation y = mx + b. If you know a point instead of the y-intercept, substitute its coordinates into the equation and solve for b.

WORKED EXAMPLE

A line has slope 3/4 and passes through (8, -2). Write its equation.

1. Start with y = 3/4x + b.
2. Substitute the point: -2 = (3/4)(8) + b.
3. Simplify and solve: -2 = 6 + b, so b = -8.

Answer: y = 3/4x - 8

PRACTICE 6 problems

1 Write the equation of a line with slope -3 and y-intercept 4.

ANSWER _____

2 Write the equation of a line with slope 2 that passes through (3, 1).

ANSWER _____

3 Write the equation of the line through (-1, 4) and (3, -4).

ANSWER _____

4 A line has an x-intercept of -4 and a y-intercept of 6. Write its equation.

ANSWER _____

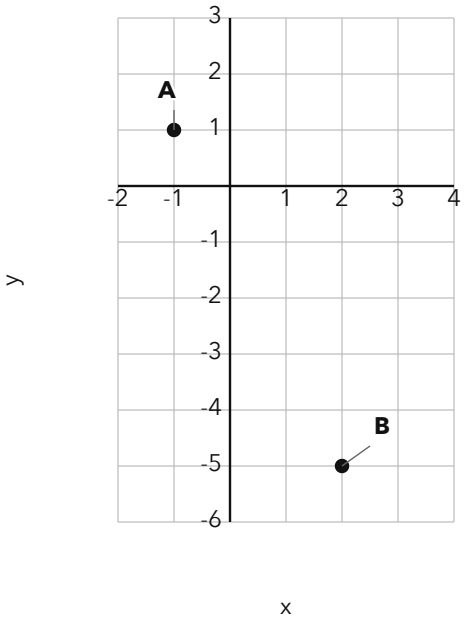
5 Write the equation of the line represented by the table.

POINTS ON A LINE

x	y
0	1
1	4
2	7
3	10

ANSWER _____

6 Use points A and B on the grid to write the equation of their line.



ANSWER _____

APPLY IT Show your work

1 At a school dance, a photo booth charges a flat fee plus a cost per print. Three prints cost $11, and seven prints cost $19. Write an equation for the total cost C of x prints.

WORK SPACE

ANSWER _____

2 You spend $24 on supplies to make custom phone charms. You sell each charm for $6. Write an equation for your profit P after selling x charms.

WORK SPACE

ANSWER _____

CHALLENGE One step up

The table follows one linear rule. Write its equation, find the missing y-value, and explain how you know the rule fits all the given points.

ONE LINEAR RULE

x	y
-3	13
1	5
5	?
9	-11

WORK SPACE AND ANSWER

ANSWER KEY

Find the Line

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Write the equation of a line with slope -3 and y-intercept 4.	**y = -3x + 4**
2	Write the equation of a line with slope 2 that passes through (3, 1).	**y = 2x - 5**
3	Write the equation of the line through (-1, 4) and (3, -4).	**y = -2x + 2**
4	A line has an x-intercept of -4 and a y-intercept of 6. Write its equation.	**y = 3/2x + 6**
5	Write the equation of the line represented by the table.	**y = 3x + 1**
6	Use points A and B on the grid to write the equation of their line.	**y = -2x - 1**

PART 2 · APPLY IT

1. **C = 2x + 5** The cost rises $8 for 4 more prints, so each print costs $2. Substitute x = 3 and C = 11 to find the $5 flat fee.
2. **P = 6x - 24** Revenue is $6 per charm. Subtract the $24 supply cost to find profit.

CHALLENGE

y = -2x + 7; the missing y-value is -3. From x = -3 to x = 1, y falls 8 as x rises 4, so the slope is -2. Substituting (1, 5) gives an intercept of 7, and x = 9 gives y = -11 as shown.

Accept equivalent equations, including forms that simplify to the listed equations. In the challenge, accept any valid check that the equation fits all three given points.