LESSON MAKER PRO

Lines From Points

Use a rate of change and a point to write a linear equation.

HIGH SCHOOL · MT.CORE.ALG.LIN.4.d

MT.CORE.ALG.LIN.4.d "Understand that linear equations can be represented in multiple forms and the specific features of each form by: Understanding the relationship between point-slope form, the rate of change, and a given point, and"

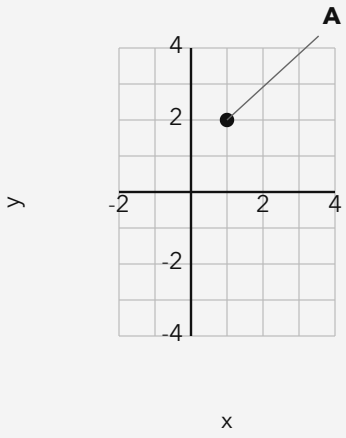
NAME _____ **DATE** _____

POINT-SLOPE FORM

In $y - y_1 = m(x - x_1)$, m is the rate of change and (x_1, y_1) is a point on the line. Subtracting a negative coordinate is the same as adding its positive opposite.

WORKED EXAMPLE

Use point A and a slope of -2 to write an equation.



1. Read A as (1, 2).
2. Substitute m = -2 and (1, 2) into $y - y_1 = m(x - x_1)$.

Answer: y - 2 = -2(x - 1)

PRACTICE 4 problems

1 Write a point-slope equation with slope 3 through (4, 5).

ANSWER _____

2 Write a point-slope equation with slope -1/2 through (-3, 6).

ANSWER _____

3 For y + 5 = 2/3(x - 6), name the slope and the point used.

ANSWER _____

4 Find the slope through (0, -3) and (4, 5). Then write a point-slope equation.

ANSWER _____

APPLY IT Show your work

1 A creator has 240 followers at week 3 and gains 18 followers each week. Write a point-slope equation for followers y after x weeks.

WORK SPACE

ANSWER _____

2 A phone battery is at 82% after 2 hours and loses 9 percentage points each hour. Write a point-slope equation for percent y after x hours. Find y at hour 5.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Do y - 4 = 3/2(x - 2) and y + 2 = 3/2(x + 2) describe the same line? Explain using the slopes and points.

WORK SPACE AND ANSWER

ANSWER KEY

Lines From Points

HIGH SCHOOL · MT.CORE.ALG.LIN.4.d

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Write a point-slope equation with slope 3 through (4, 5).	**y - 5 = 3(x - 4)**
2	Write a point-slope equation with slope -1/2 through (-3, 6).	**y - 6 = -1/2(x + 3)**
3	For y + 5 = 2/3(x - 6), name the slope and the point used.	**Slope: 2/3; point: (6, -5)**
4	Find the slope through (0, -3) and (4, 5). Then write a point-slope equation.	**Slope: 2; y + 3 = 2(x - 0)**

PART 2 · APPLY IT

1. **y - 240 = 18(x - 3)** Use the rate 18 and the point (3, 240).
2. **y - 82 = -9(x - 2); y = 55 at hour 5** Use the rate -9 and the point (2, 82). Substituting x = 5 gives y = 82 - 27 = 55.

CHALLENGE

Yes. Both slopes are 3/2, and the slope between their points, (2, 4) and (-2, -2), is (-2 - 4)/(-2 - 2) = 3/2.

Accept equivalent equations that represent the requested line. For problem 3, students must identify the slope and point shown in the given equation.