LESSON MAKER PRO

Lines That Climb

Find the rate and starting value.

GRADE 7 · 7A.PR.B.6

7A.PR.B.6 "Interpret y = mx + b as defining a linear equation whose graph is a line with m as the slope and b as the y-intercept. a. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line..."

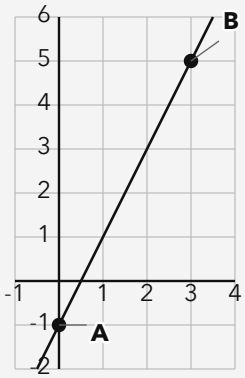
NAME _____ DATE _____

SLOPE AND START

To find slope, divide the change in y by the change in x. In y = mx + b, m is the slope and b is the y-value when x = 0.

WORKED EXAMPLE

Use points A and B to find the slope and write the line's equation.



1. From A to B, the rise is 6 and the run is 3.
2. Slope = 6/3 = 2.
3. At x = 0, y = -1, so b = -1.

Answer: y = 2x - 1

PRACTICE 4 problems

1 Find the slope through (2, 3) and (6, 11).

ANSWER _____

2 Find the slope through (1, 8) and (4, 2).

ANSWER _____

3 A line has slope 3 and passes through (2, 9). Find its y-intercept.

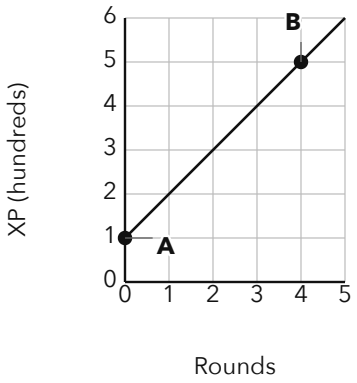
ANSWER _____

4 Two lines have slope 4. Their y-intercepts are 7 and -2. Write both equations.

ANSWER _____

APPLY IT Show your work

1 A game's XP grows as shown. How much XP do you start with, and how much do you earn per round?



ANSWER _____

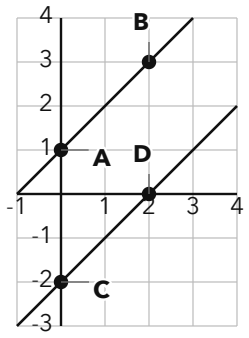
2 A music app charges $9 to join and $4 each month. Write y = mx + b for the total cost y after x months. What does the slope mean?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Find the slope and y-intercept of each line. Why does a line's slope stay the same between any two of its points?



WORK SPACE AND ANSWER

ANSWER KEY

Lines That Climb

GRADE 7 · 7A.PR.B.6

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the slope through (2, 3) and (6, 11).	**2**
2	Find the slope through (1, 8) and (4, 2).	**-2**
3	A line has slope 3 and passes through (2, 9). Find its y-intercept.	**3**
4	Two lines have slope 4. Their y-intercepts are 7 and -2. Write both equations.	**y = 4x + 7 and y = 4x - 2**

PART 2 · APPLY IT

1. **Start with 100 XP; earn 100 XP per round.** The y-intercept is 1 hundred XP. The line rises 4 hundreds over 4 rounds, or 1 hundred XP per round.
2. **y = 4x + 9; the cost rises $4 each month.** The joining fee is the initial value, 9. The monthly charge is the rate of change, 4.

CHALLENGE

Line AB has slope 1 and y-intercept 1. Line CD has slope 1 and y-intercept -2. Rise/run triangles drawn between any two points on one line are similar, so their rise/run ratios are equal.

Accept equivalent slope calculations. In the challenge, accept an explanation that uses similar triangles to show the rise/run ratio stays constant.