LESSON MAKER PRO

Same Slope, Different Start

Find what changes and what stays the same.

GRADE 7 · 7A.PR.B.6.d

7A.PR.B.6.d "Given that the slopes for two different sets of points are equal, demonstrate that the linear equations that include those two sets of points may have different y-intercepts."

NAME _____ DATE _____

SLOPE AND STARTING VALUE

Find a line's slope by dividing the change in y by the change in x. Then use a point in y = mx + b to find b, the y-intercept. Two lines can have the same slope but different y-intercepts.

WORKED EXAMPLE

Find the equation for each set of points.

A: x	A: y	B: x	B: y
4	14	4	24
9	29	9	39

1. A slope: (29 - 14)/(9 - 4) = 3.
2. B slope: (39 - 24)/(9 - 4) = 3.
3. A y-intercept: 14 - 3(4) = 2.
4. B y-intercept: 24 - 3(4) = 12.

Answer: A: y = 3x + 2. B: y = 3x + 12.

PRACTICE 4 problems

1 A: (0, 1), (5, 6). B: (0, 8), (5, 13). Find both equations.

ANSWER _____

2 A: (0, 11), (6, 5). B: (0, 16), (6, 10). Find both equations.

ANSWER _____

3 A: (5, 5), (7, 6). B: (5, 10), (7, 11). Find both equations.

ANSWER _____

4 A: (5, 15), (10, 5). B: (5, 11), (10, 1). Find both equations.

ANSWER _____

APPLY IT Show your work

1 The table shows two gaming channels' follower counts after x days. Find each daily gain, starting count, and equation.

CHANNEL FOLLOWERS

Days (x)	A followers (y)	B followers (y)
1	25	40
5	45	60

ANSWER _____

2 Two skate parks charge a starting fee plus a cost per visit. For x visits, Park A costs y dollars at (1, 18) and (5, 46). Park B costs y dollars at (1, 30) and (5, 58). Find each cost per visit, starting fee, and equation.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Line A passes through (1, 6) and (5, 26). Line B has the same slope and passes through (5, 36). Find both equations. Explain why they differ.

WORK SPACE AND ANSWER

ANSWER KEY # Same Slope, Different Start

GRADE 7 · 7A.PR.B.6.d

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A: (0, 1), (5, 6). B: (0, 8), (5, 13). Find both equations.	**A: y = x + 1. B: y = x + 8.**
2	A: (0, 11), (6, 5). B: (0, 16), (6, 10). Find both equations.	**A: y = -x + 11. B: y = -x + 16.**
3	A: (5, 5), (7, 6). B: (5, 10), (7, 11). Find both equations.	**A: y = 1/2x + 5/2. B: y = 1/2x + 15/2.**
4	A: (5, 15), (10, 5). B: (5, 11), (10, 1). Find both equations.	**A: y = -2x + 25. B: y = -2x + 21.**

PART 2 · APPLY IT

1. **Both gain 5 followers per day. A starts with 20: y = 5x + 20. B starts with 35: y = 5x + 35.** Each count rises by 20 over 4 days, so both rates are 5. Subtract 5 from each day-1 count to find the starting counts.
2. **Both cost $7 per visit. A starts at $11: y = 7x + 11. B starts at $23: y = 7x + 23.** Each total rises by $28 over 4 visits, so the cost is $7 per visit. Subtract $7 from each one-visit total to find the starting fees.

CHALLENGE

A has slope (26 - 6)/(5 - 1) = 5 and equation y = 5x + 1. B has equation y = 5x + 11 because 36 = 5(5) + 11. Their slopes match, but their y-intercepts differ.

Accept equivalent equations. In the challenge, the explanation must identify the different y-intercepts, not just the different point values.