LESSON MAKER PRO

Function Feature Faceoff

Compare rates of change and starting values.

HIGH SCHOOL · MA.912.F.1.5

MA.912.F.1.5 "Compare key features of linear functions each represented algebraically, graphically, in tables or written descriptions."

NAME _____ DATE _____

COMPARE THE FEATURES

In y = mx + b, m is the rate of change and b is the y-intercept, or starting value. Find these two features in each representation, then compare them.

WORKED EXAMPLE

Compare F(x) = 8x - 6 and G(x) = 5x + 9.

1. F has rate 8 and y-intercept -6.
2. G has rate 5 and y-intercept 9.
3. Compare 8 to 5, then compare -6 to 9.

Answer: F has the greater rate of change. G has the greater y-intercept.

PRACTICE 5 problems

1 Compare A: y = 2x + 7 and B: y = 3x + 1. Which function has the greater rate? Which has the greater y-intercept?

ANSWER _____

2 Function H has points (0, -4), (2, 0), and (4, 4). Function K is y = 2x + 3. Compare their rates and y-intercepts.

ANSWER _____

3 Plan A charges $4 to join and $7 each month. Plan B charges $10 to join and $3 each month. Compare the monthly rates and starting costs.

ANSWER _____

4 Line P passes through (0, -1) and (3, 2). Line Q passes through (0, 4) and (3, -2). Which line has the greater rate? Which has the greater y-intercept?

ANSWER _____

5 Compare E: y = -3x + 12 and F: y = -3x - 2. How are their rates and y-intercepts alike or different?

ANSWER _____

APPLY IT Show your work

1 A music app costs $14 to start and $3 per month. Another app costs $10 to start and $7 per month. Compare their monthly rates and starting costs. After how many months will the total costs be equal?

WORK SPACE

ANSWER _____

2 Creator A earns a $20 bonus plus $3 for each sticker sold. Creator B earns a $4 bonus plus $7 for each sticker sold. Compare their rates and starting amounts. How many stickers must they sell to earn the same amount?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Function A is y = -2x + 12. Function B has points (0, 7), (2, 3), and (4, -1). Function C starts at 4 and decreases by 3 for each increase of 1 in x. Name the parallel pair, order the rates from greatest to least, and identify the greatest y-intercept.

WORK SPACE AND ANSWER

ANSWER KEY

Function Feature Faceoff

HIGH SCHOOL · MA.912.F.1.5

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Compare A: y = 2x + 7 and B: y = 3x + 1. Which function has the greater rate? Which has the greater y-intercept?	**B has the greater rate, 3. A has the greater y-intercept, 7.**
2	Function H has points (0, -4), (2, 0), and (4, 4). Function K is y = 2x + 3. Compare their rates and y-intercepts.	**Both have rate 2. K has y-intercept 3, which is greater than H's y-intercept of -4.**
3	Plan A charges $4 to join and $7 each month. Plan B charges $10 to join and $3 each month. Compare the monthly rates and starting costs.	**Plan A has the greater monthly rate, $7. Plan B has the greater starting cost, $10.**
4	Line P passes through (0, -1) and (3, 2). Line Q passes through (0, 4) and (3, -2). Which line has the greater rate? Which has the greater y-intercept?	**P has the greater rate, 1. Q has the greater y-intercept, 4.**
5	Compare E: y = -3x + 12 and F: y = -3x - 2. How are their rates and y-intercepts alike or different?	**They have the same rate, -3. E has y-intercept 12, and F has y-intercept -2.**

PART 2 · APPLY IT

1. **The second app has the greater monthly rate, $7, and the first app has the greater starting cost, $14. The costs are equal after 1 month, when both cost $17.** Set 14 + 3m equal to 10 + 7m. Solving gives m = 1, and each total is $17.
2. **Creator B has the greater rate, $7 per sticker. Creator A has the greater starting amount, $20. They earn the same amount after 4 stickers, when each earns $32.** Set 20 + 3s equal to 4 + 7s. Solving gives s = 4, and each earnings total is $32.

CHALLENGE

A and B are parallel. The rates are A = B = -2, then C = -3. A has the greatest y-intercept, 12.

Accept equivalent statements of rate, slope, y-intercept, initial value, and starting cost. For equal rates, accept that the functions are parallel when both are linear.