LESSON MAKER PRO

Function Face-Off

Compare rates and starting values.

GRADE 8 · 8.FGR.5.4

8.FGR.5.4 "Compare properties (rate of change and initial value) of two functions used to model an authentic situation each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions)."

NAME _____ DATE _____

COMPARE TWO FUNCTIONS

The rate of change tells how much y changes when x increases by 1. The initial value is the y-value when x = 0. All functions on this worksheet are assumed linear. Point pairs alone would not establish that an unrestricted function is linear.

WORKED EXAMPLE

Compare A: y = 8x + 19 and B: (0, 6), (2, 22), (4, 38).

1. A has rate 8 and initial value 19.
2. For B, rate = (22 - 6) / (2 - 0) = 16 / 2 = 8.
3. B has rate 8 and initial value 6.

Answer: Same rate. A has the greater initial value.

PRACTICE 5 problems

1 Compare A: y = 5x + 1 and B: starts at 7 and rises 5 each hour.

ANSWER _____

2 Compare A: (1, 12), (5, 32) and B: y = 7x + 11.

ANSWER _____

3 Compare C: starts at 12 and decreases 1 each day and D: (1, 13), (7, 7).

ANSWER _____

4 Compare E: (1, 12), (5, 40) and F: y = 7x + 11.

ANSWER _____

5 Compare A: y = 7x + 3 and B: (1, 12), (7, 42).

ANSWER _____

APPLY IT Show your work

1 A club hoodie shop charges these totals: (1, $12) and (5, $32). Another shop charges y = 7x + 1 dollars. Compare the rates and initial values.

WORK SPACE

ANSWER

2 One gaming center charges $12 to enter plus $5 per game. Another center charges these totals: (3, $24) and (7, $52). Compare the rates and initial values.

WORK SPACE

ANSWER

CHALLENGE One step up

A table has points (1, 17), (5, 37), and (7, 47). Function B starts at 12 and increases 5 for each 1 x. Are the functions the same? Explain.

WORK SPACE AND ANSWER

ANSWER KEY

Function Face-Off

GRADE 8 · 8.FGR.5.4

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Compare A: y = 5x + 1 and B: starts at 7 and rises 5 each hour.	**Both have rate 5. B has initial value 7, and A has initial value 1.**
2	Compare A: (1, 12), (5, 32) and B: y = 7x + 11.	**A has rate 5 and initial value 7. B has rate 7 and initial value 11.**
3	Compare C: starts at 12 and decreases 1 each day and D: (1, 13), (7, 7).	**Both have rate -1. C has initial value 12, and D has initial value 14.**
4	Compare E: (1, 12), (5, 40) and F: y = 7x + 11.	**Both have rate 7. E has initial value 5, and F has initial value 11.**
5	Compare A: y = 7x + 3 and B: (1, 12), (7, 42).	**A has rate 7 and initial value 3. B has rate 5 and initial value 7.**

PART 2 · APPLY IT

1. **The first shop has rate $5 per hoodie and initial value $7. The second shop has rate $7 per hoodie and initial value $1.** Find the first shop's rate from the table, then use its cost for 1 hoodie to find its initial value.
2. **The first center has rate $5 per game and initial value $12. The second center has rate $7 per game and initial value $3.** The first center is given verbally. For the second center, the cost rises $28 over 4 games, so its rate is $7 per game.

CHALLENGE

Yes. The table has rate 5 and initial value 12, which match Function B.

Accept equivalent language such as starting value, y-intercept, or fee for initial value. Accept correct rate calculations using any pair of table points.