

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 $x = 0$.

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

CHALLENGE

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.

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

- 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.
- 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.