

Rate Matchup

Compare functions shown in different forms.

GRADE 8 • 8.F.A.2

CCSS.Math.Content.8.F.A.2 "Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example..."

NAME _____

DATE _____

COMPARE RATES

Find each function's rate of change before you compare. In $y = mx + b$, the coefficient of x is the rate. A negative rate closer to zero is greater.

WORKED EXAMPLE

Function A is shown in a table: x : 8, 12; y : 9, 21. Function B is $y = x + 6$. Which function has the greater rate of change?

1. Rate A = $(21 - 9) / (12 - 8)$.
2. Rate A = $12 / 4 = 3$.
3. Rate B = 1, the coefficient of x .
4. Since $3 > 1$, Function A has the greater rate.

Answer: Function A

PRACTICE 5 problems

- 1** F: $y = 5x + 2$. G is shown by x : 0, 2; y : 7, 11. Which function has the greater rate of change?

ANSWER _____

- 2** H is shown by x : 0, 5, 10; y : 0, 10, 20. J begins at 7 and increases by 5 for each input. Which function has the greater rate of change?

ANSWER _____

- 3** Graph K passes through (0, 0) and (5, 10). L: $y = (2/7)x + 5$. Which function has the greater rate of change?

ANSWER _____

- 4** M decreases by 7 for every increase of 2 in its input. N: $y = -2x$. Which function has the greater rate of change?

ANSWER _____

- 5** P is shown by x : 0, 5, 10; y : 7, 17, 27. Q: $y = 2x - 7$. Compare their rates of change.

ANSWER _____

APPLY IT Show your work

- 1** Two music apps track downloaded songs. App A is shown by weeks: 0, 2; songs: 5, 15. App B starts with 7 songs and adds 2 songs each week. Which app's song total grows faster?

WORK SPACE

ANSWER _____

- 2** A game-data plan costs 7 dollars plus 2 dollars per GB. A second plan is shown by GB: 0, 5; cost: 2 dollars, 27 dollars. Which cost grows faster, and what does each plan cost for 5 GB?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Function R is $y = 2x + 2$. Function S starts at 10 and rises $\frac{2}{5}$ for each input. Which starts higher? Which rises faster? Will R catch S? Explain.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	F: $y = 5x + 2$. G is shown by x: 0, 2; y: 7, 11. Which function has the greater rate of change?	F, with rate 5. G has rate 2.
2	H is shown by x: 0, 5, 10; y: 0, 10, 20. J begins at 7 and increases by 5 for each input. Which function has the greater rate of change?	J, with rate 5. H has rate 2.
3	Graph K passes through (0, 0) and (5, 10). L: $y = (2/7)x + 5$. Which function has the greater rate of change?	K, with rate 2. L has rate $2/7$.
4	M decreases by 7 for every increase of 2 in its input. N: $y = -2x$. Which function has the greater rate of change?	N, because $-2 > -7/2$.
5	P is shown by x: 0, 5, 10; y: 7, 17, 27. Q: $y = 2x - 7$. Compare their rates of change.	They have the same rate of change, 2.

PART 2 • APPLY IT

- App A grows faster, at 5 songs per week.** App A has rate $(15 - 5) / (2 - 0) = 5$. App B has rate 2.
- The second plan grows faster. At 5 GB, the first plan costs 17 dollars and the second plan costs 27 dollars.** The first plan has rate 2 dollars per GB. The second plan has rate $(27 - 2) / 5 = 5$ dollars per GB.

CHALLENGE

S starts higher, 10 versus 2. R rises faster, 2 versus $2/5$, and R catches S at $x = 5$.

Accept equivalent rate calculations, including simplified fractions. For the challenge, students should identify both starting values and rates, then state $x = 5$.