LESSON MAKER PRO

Rate Race

Compare linear functions shown in different ways.

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..."

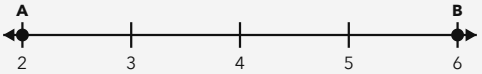
NAME _____ DATE _____

COMPARE RATES

For a linear function, the rate of change is the change in y divided by the change in x. In y = mx + b, m is the rate of change. Compare the rates, including whether they are positive or negative.

WORKED EXAMPLE

The number line shows x-values A and B. Function P is y = 5x - 3. For Function Q, y is 4 at A and 16 at B. Which function has the greater rate of change?



1. Function P has rate 5.
2. For Q, change in y = 16 - 4 = 12.
3. For Q, change in x = 6 - 2 = 4, so its rate is 12/4 = 3.
4. Since 5 > 3, P has the greater rate.

Answer: Function P

PRACTICE 4 problems

1 Function R is y = -7x + 9. Function S passes through (10, 1) and (17, 64). Find both rates. Which function has the greater rate of change?

ANSWER _____

2 Function T starts with 15 points and loses 11 points each week. Function U is y = -8x + 15. Which function has the greater rate of change?

ANSWER _____

3 Function V passes through (8, 21) and (11, 45). Function W gains 7 meters each minute. Which function has the greater rate of change?

ANSWER _____

4 Function X passes through (9, 30) and (12, 12). Function Y is y = -5x + 18. Which function has the greater rate of change?

ANSWER _____

APPLY IT Show your work

1 At an arcade, the table shows tickets earned by Club A. Club B earns 9 tickets per game. Which club earns tickets faster, and by how many tickets per game?

CLUB A ARCADE TICKETS

Games	Tickets
3	8
7	28
11	48

ANSWER _____

2 A video editor has 22 minutes of storage left and uses 4 minutes of storage for each clip. Another editor loses 6 minutes of storage for each clip. Which editor has the greater rate of change in storage?

WORK SPACE

ANSWER _____

CHALLENGE One step up

The number line shows x-values A and B. Function M has y-value 9 at A and 39 at B. Function N is y = 5x - 2. Do M and N represent the same function? Explain using rate and starting value.



WORK SPACE AND ANSWER

ANSWER KEY

Rate Race

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Function R is y = -7x + 9. Function S passes through (10, 1) and (17, 64). Find both rates. Which function has the greater rate of change?	**R: -7; S: 9. Function S has the greater rate of change.**
2	Function T starts with 15 points and loses 11 points each week. Function U is y = -8x + 15. Which function has the greater rate of change?	**Function U**
3	Function V passes through (8, 21) and (11, 45). Function W gains 7 meters each minute. Which function has the greater rate of change?	**Function V**
4	Function X passes through (9, 30) and (12, 12). Function Y is y = -5x + 18. Which function has the greater rate of change?	**Function Y**

PART 2 · APPLY IT

1. **Club B, by 4 tickets per game.** Club A's rate is (28 - 8)/(7 - 3) = 5 tickets per game. Compare 5 to Club B's rate of 9.
2. **The first editor, with a rate of -4 minutes per clip.** The first editor is y = -4x + 22, so its rate is -4. Since -4 is greater than -6, the first editor has the greater rate.

CHALLENGE

No. Function M has rate (39 - 9)/(7 - 1) = 5 and equation y = 5x + 4. Function N has rate 5 but equation y = 5x - 2, so the starting values are different.

Accept equivalent rate calculations, such as 30/6 = 5. For the challenge, students must state that equal rates alone do not make two functions the same.