

Function Face-Off

Compare rates, starts, and outputs.

HIGH SCHOOL • MA.912.F.1.7

MA.912.F.1.7 "Compare key features of two functions each represented algebraically, graphically, in tables or written descriptions."

NAME _____

DATE _____

KEY FEATURES

For a linear function $mx+b$, m is the rate of change and b is the y-intercept. Compare rates, starting values, and whether each function increases or decreases.

WORKED EXAMPLE

Compare $f(x)=5x+8$ and $g(x)=-2x+6$.

1. f has rate 5 and y-intercept 8.
2. g has rate -2 and y-intercept 6.
3. A positive rate increases. A negative rate decreases.

Answer: f increases with rate 5 and starts at 8. g decreases with rate -2 and starts at 6.

PRACTICE 5 problems

- 1** Compare $f(x)=3x+1$ and $g(x)=x+7$. Which has the greater rate? Which has the greater y-intercept?

ANSWER _____

- 2** Use the table. x : 0, 1, 2. $p(x)$: 4, 7, 10. $q(x)$: 13, 10, 7. Which function decreases? State both rates.

ANSWER _____

- 3** Function A passes through (0,2) and (3,11). Function B passes through (0,4) and (3,10). Which has the greater rate?

ANSWER _____

- 4** Compare $f(x)=-3x+4$ and $g(x)=-x+4$. What feature is the same? Which decreases faster?

ANSWER _____

- 5** Compare $f(x)=x^2$ and $g(x)=4x$. At which x -values do the functions have the same output?

ANSWER _____

APPLY IT Show your work

- 1** A school art club charges \$12 plus \$4 per print. Another shop charges \$7 per print. At how many prints do the costs match? Which is cheaper for more prints?

WORK SPACE

ANSWER _____

- 2** Scooter rental A costs \$11 to unlock plus \$3 per mile. Rental B costs \$17 to unlock plus \$1 per mile. At what distance do the costs match? Which is cheaper for less than that distance?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Function A has this table: x: 0, 1, 2. A(x): 13, 10, 7. Function B is $B(x) = -x + 9$. Write a rule for A. Then find where A and B have the same output, and state which function drops faster.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Compare $f(x)=3x+1$ and $g(x)=x+7$. Which has the greater rate? Which has the greater y-intercept?	f has the greater rate, 3. g has the greater y-intercept, 7.
2	Use the table. x: 0, 1, 2. p(x): 4, 7, 10. q(x): 13, 10, 7. Which function decreases? State both rates.	q decreases. p has rate 3, and q has rate -3.
3	Function A passes through (0,2) and (3,11). Function B passes through (0,4) and (3,10). Which has the greater rate?	A has the greater rate. A has rate 3, and B has rate 2.
4	Compare $f(x)=-3x+4$ and $g(x)=-x+4$. What feature is the same? Which decreases faster?	They have the same y-intercept, 4. f decreases faster.
5	Compare $f(x)=x^2$ and $g(x)=4x$. At which x-values do the functions have the same output?	x=0 and x=4.

PART 2 • APPLY IT

- The costs match at 4 prints, when each costs \$28. The art club is cheaper for more than 4 prints.** Set $12+4x=7x$, so $x=4$. Since 4 is less than 7, the art club has the lower cost after that point.
- The costs match at 3 miles, when each costs \$20. Rental A is cheaper for less than 3 miles.** Set $11+3x=17+x$, so $x=3$. Before 3 miles, A has the lower total cost.

CHALLENGE

$A(x)=-3x+13$. They have the same output when $x=2$, and both outputs are 7. A drops faster.

Accept equivalent wording such as slope for rate of change and initial value for y-intercept. For the word problems, accept correct equations and comparisons stated in words.