LESSON MAKER PRO

# 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** The functions p and q are linear. 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** Both functions below are linear. 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

Linear 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.

WORK SPACE AND ANSWER

**ANSWER KEY**

# Function Face-Off

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## 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 | The functions p and q are linear. 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 | Both functions below are linear. 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

1. **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.
2. **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.