LESSON MAKER PRO

# Function Faceoff

*Compare how functions start and grow.*

**GRADE 8 · MT.8.F.2**

**MT.8.F.2** "Compare properties of two functions using tables, graphs, and equations."

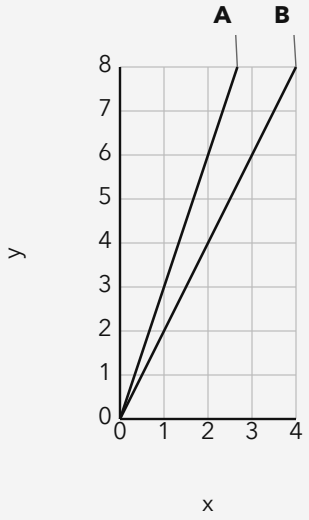
NAME _____ DATE _____

## COMPARE TWO FUNCTIONS

A function's rate of change tells you how much y changes when x increases by 1. On a graph, compare how far lines rise over the same horizontal distance. In y = mx + b, m is the rate and b is the value at x = 0.

### WORKED EXAMPLE

Which line grows faster? How much faster does it grow for each increase of 1 in x?




1. At x = 0, both lines are at y = 0.
2. At x = 1, A is at 3 and B is at 2.
3. A grows by 3, while B grows by 2. The difference is 1.

**Answer: A grows faster by 1 unit of y for each increase of 1 in x.**

## PRACTICE 4 problems

**1** A: y = 4x + 6. B: y = 8x + 9. Which grows faster, and by how much per increase of 1 in x?

**ANSWER** _____

**2** A: y = 6x + 10. B: y = 4x + 8. Which starts higher at x = 0, and by how much?

**ANSWER** _____

**3** A: y = 9x + 4. B: y = 6x + 10. Which grows faster? Which starts higher?

**ANSWER** _____

**4** A: y = 8x + 4. B: y = 4x + 8. At what x do they have the same y?

**ANSWER** _____

## APPLY IT Show your work

**1** A video file gets larger as a clip gets longer. App A is shown in the table. For App B, y = 9x + 8, where x is minutes and y is MB. Which app adds more MB per minute, and how many more?

**APP A**

| Minutes (x) | File size (MB) |
|---|---|
| 0 | 5 |
| 1 | 11 |
| 4 | 29 |

**ANSWER** _____

**2** Two gaming teams earn points as rounds pass. Team A is shown in the table. Team B follows y = 4x + 9, where x is rounds and y is points. Which team starts with more points, and how many more?

**TEAM A**

| Rounds (x) | Points |
|---|---|
| 0 | 6 |
| 1 | 14 |
| 4 | 38 |

**ANSWER** _____

## CHALLENGE One step up

Function A is shown in the table. Function B is y = 6x + 4. Which starts higher, which grows faster, and at what x do they have the same y?

**FUNCTION A**

| x | y |
|---|---|
| 0 | 10 |
| 1 | 14 |
| 4 | 26 |

WORK SPACE AND ANSWER

**ANSWER KEY**

# Function Faceoff

**GRADE 8 · MT.8.F.2**

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | A: y = 4x + 6. B: y = 8x + 9. Which grows faster, and by how much per increase of 1 in x? | **B, by 4.** |
| 2 | A: y = 6x + 10. B: y = 4x + 8. Which starts higher at x = 0, and by how much? | **A, by 2.** |
| 3 | A: y = 9x + 4. B: y = 6x + 10. Which grows faster? Which starts higher? | **A grows faster. B starts higher.** |
| 4 | A: y = 8x + 4. B: y = 4x + 8. At what x do they have the same y? | **x = 1** |

## PART 2 · APPLY IT

1. **App B, by 3 MB per minute.** App A adds 11 - 5 = 6 MB per minute. App B adds 9 MB per minute, so the difference is 3 MB per minute.
2. **Team B, by 3 points.** At x = 0, Team A has 6 points and Team B has 9 points. The difference is 3 points.

## CHALLENGE

**A starts higher. B grows faster. They have the same y when x = 3.**

Accept equivalent wording for rates and starting values. In the challenge, both functions equal 22 at x = 3.