Compare and Contrast
Slope of Lines

Chapter 8 Section 4
SLOPE IS A RATIO!!!

• Slope = rise:run
• Rise is the vertical change
• Run is the horizontal change
• Example

• We will write the ratio as the fraction \( \frac{\text{Rise}}{\text{Run}} \)
Book stacking activity

- Team up with the people in your row and record your slopes in the given table
- Use your data to answer questions about slope
- Discussion
Slope Calisthenics (Comparing Slopes)

Imagine that you are walking on this line from left to right. How would you describe your trip?
Slope Calisthenics (Comparing Slopes) (cont.)

If the line rises as you move from left to right, then the slope is positive.

Make a prediction about the slope if the line falls as you move from left to right.

It’s negative!!
Slope Calisthenics (Comparing Slopes) (cont.)
Slope Calisthenics (Comparing Slopes) (cont.)
Slope Calisthenics (Comparing Slopes) (cont.)
Slope Calisthenics (Comparing Slopes) (cont.)
Slope Calisthenics (Comparing Slopes) (cont.)

What about this line?  Or this line?
How do you calculate slope?

We denote slope with a small letter $m$.

Why?

Mathematical Urban Legend

Comes from the French word *monter* which means to climb

There’s really no good reason.
How do you calculate slope? (cont.)

Given two points on a line, you can find the slope \( m \) using this formula:

\[
m = \frac{\text{rise}}{\text{run}} = \frac{\text{difference in y-coordinates}}{\text{difference in x-coordinates}}
\]
Find the slope of the following line.

Consider the line. What should you expect the slope to be?
Positive

Consider the given points. What are the y coordinates?
7 and 2

What are the x coordinates?
4 and 1
Find the slope of the following line.

\[ m = \frac{7 - 2}{4 - 1} = \frac{5}{3} \]
How will you remember the formula for slope?

Book
Imagine that you are seating. Can you run before you rise?

Former teacher of mine
Don’t smash your yak.
Warning!!

When you calculate a slope, be sure to use the x and y coordinates of the two points in the same order.
You try

Find the slope of the line through the given points.

a) (-2, 5) and (6, 1)

b) (5,0) and (7,8)
Horizontal and Vertical Lines

Left image:
- Points: (-2, 2) and (4, 2)
- Line: horizontal passing through y = 2

Right image:
- Points: (3, 2) and (3, -4)
- Line: vertical passing through x = 3
Challenge

After you leave class today, think about the many different slopes you encounter in your personal life.