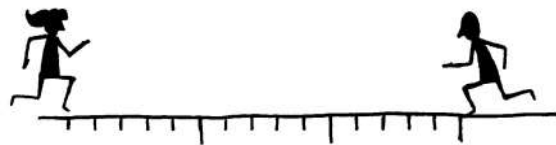NAME _____ DATE _____

## Scenario

Angela and Blake are running toward each other from 15 m away. At time t = 0 s, Angela runs to the right at 5 m/s, and Blake runs to the left at 3 m/s.

Using Representations

PART A: Complete the table and draw a position vs. time graph for Angela and Blake for the first 3 seconds. Make each graph a different color and include a key.

Time (seconds)	Angela's Position (meters)	Blake's Position (meters)
0		
1		
2		
3		
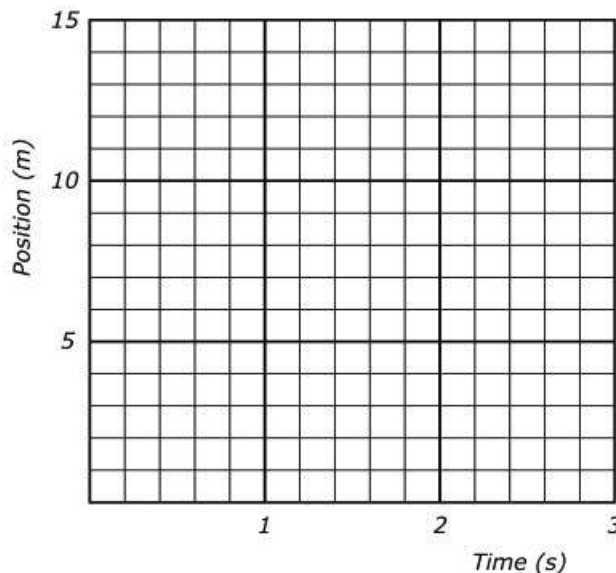
Quantitative Analysis

PART B: Calculate the *slope* of the line you drew in Part A for Angela by choosing two points on the line and filling in the equation below:

$$slope = \frac{rise}{run} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{(\quad)\,\text{m} - (\quad)\,\text{m}}{(\quad)\,\text{s} - (\quad)\,\text{s}} = \frac{\quad}{\quad}\frac{\text{m}}{\text{s}} = (\quad)$$

PART C: Calculate the *slope* of the line you drew in Part A for Blake by choosing two points on the line and filling in the equation below:

$$slope = \frac{rise}{run} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{(\quad)\,\text{m} - (\quad)\,\text{m}}{(\quad)\,\text{s} - (\quad)\,\text{s}} = \frac{\quad}{\quad}\frac{\text{m}}{\text{s}} = (\quad)$$

Using Representations

PART D: Based on the slopes you calculated in Parts B and C, sketch a velocity vs. time graph for Angela and Blake. Make each graph a different color and include a key.
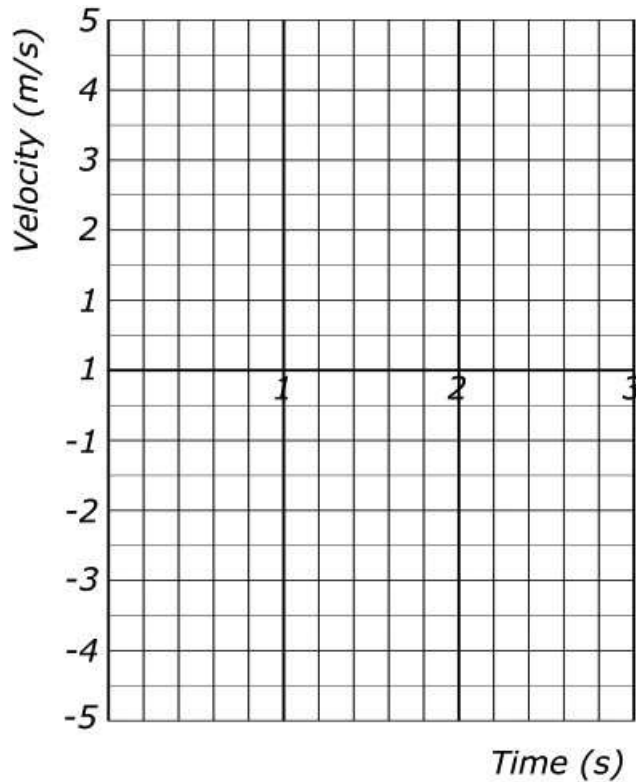
Argumentation

PART E: Carlos makes the following claim about the intersection point of the two lines on the position vs. time graph in Part A. "The point on the position vs. time graph where the two lines cross represents the time when Angela and Blake are at the same position and traveling at the same velocity."

The student's claim is partially correct. Fill in the blanks of the following statement using evidence from the graph to correct the student's claim.

Claim: I agree that the _____ is the same because Angela and Blake do have the same
            physical quantity

_____ of _____ meters at _____ seconds. However, I do not agree that they have the
physical quantity   *number*   *number*

same _____ because the slope of one line is _____ m/s and the slope of the other line
     physical quantity   *number*

is _____ m/s.
   number