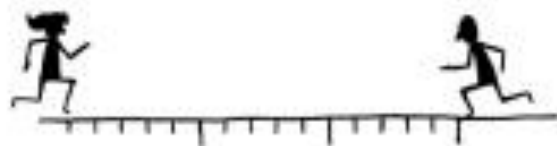


NAME _____

DATE _____

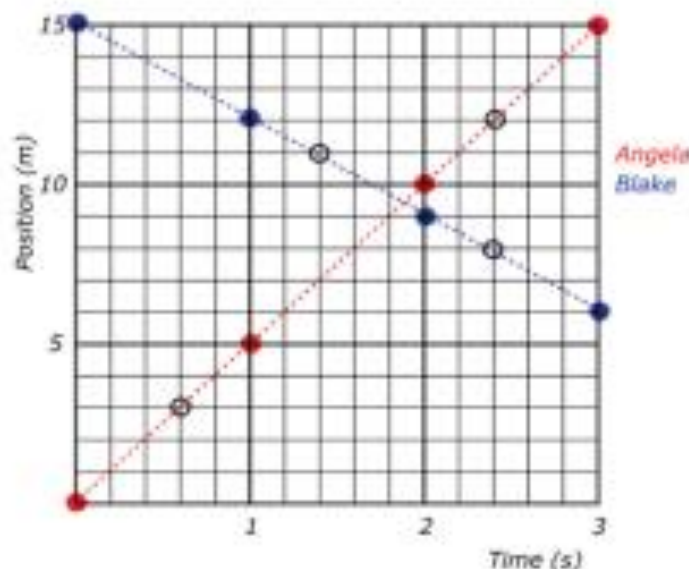
Scenario

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	0	15
1	5	12
2	10	9
3	15	6

**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:

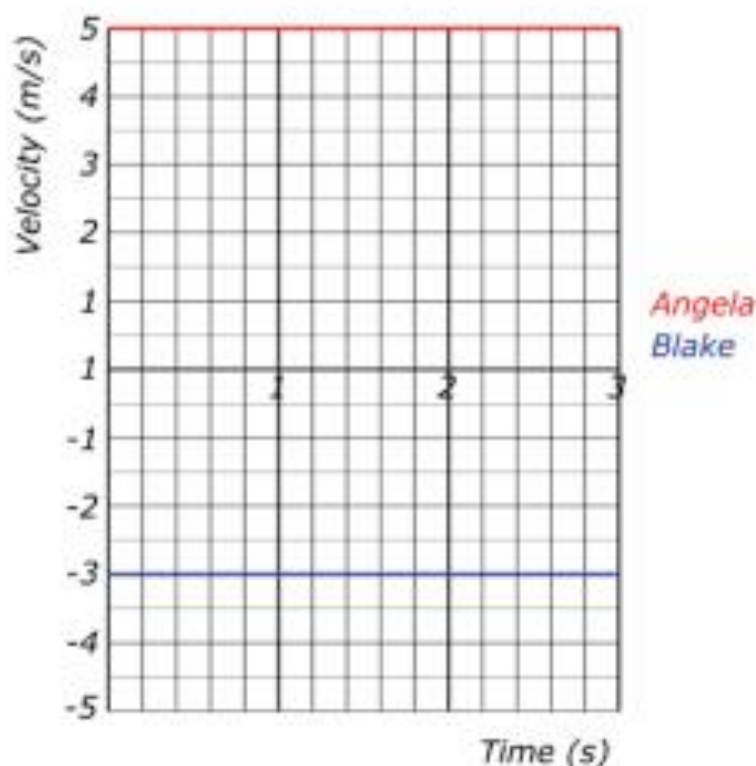
$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{(12)\text{m} - (3)\text{m}}{(2.4)\text{s} - (0.6)\text{s}} = \frac{9}{1.8} \frac{\text{m}}{\text{s}} = (5 \frac{\text{m}}{\text{s}})$$

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:

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{(7)\text{m} - (11)\text{m}}{(2.6)\text{s} - (1.3)\text{s}} = \frac{-4}{1.3} \frac{\text{m}}{\text{s}} = (-3 \frac{\text{m}}{\text{s}})$$

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 position physical quantity is the same because Angela and Blake do have the same position physical quantity of 9.5 number meters at 1.9 number seconds. However, I do not agree that they have the same velocity physical quantity because the slope of one line is 5 number m/s and the slope of the other line is 3 number m/s.