NAME _____ DATE _____

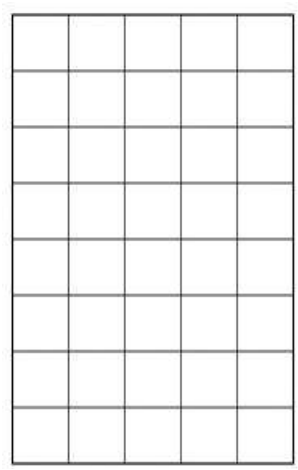
Scenario

A car traveling in a straight line to the right starts from rest at time $t = 0$.
At time $t = 2$ s, *the car is traveling at* 4 m/s. *At* $t = 4$ s *the car is traveling at* 8 m/s.

Using Representations

PART A: Scale and label the axes on the graph to the right. Using the data table below, plot a velocity vs. time graph for the car for the first 4 seconds it is traveling.

***Time** (s)*	***Speed** (m/s)*
0	0
1	2
2	4
3	6
4	8



Argumentation

PART B: **Evidence:** Calculate the slope of the velocity vs. time graph in Part A using two points on the line (NOT data points).

$$slope = \frac{rise}{run} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{(\quad)\frac{\text{m}}{\text{s}} - (\quad)\frac{\text{m}}{\text{s}}}{(\quad)\text{s} - (\quad)\text{s}} = \_\_\_\_\frac{\text{m}}{\text{s}^2} = (\qquad)$$

Claim: Use the evidence above to make a claim by filling in the following blanks:

The slope of the velocity vs. time graph is equal to _____ _____. _____ is also the unit for _____.
(number) (unit) (unit) (physical quantity)

Quantitative Analysis

$Area = \frac{1}{2}bh$

PART C: Rewrite the equation for the area of a triangle ($Area = \frac{1}{2}\ base \times height$) using the symbols and numbers (with units) from the graph in Part A between $t = 0$ and $t = 4$ seconds.

$$\underset{\text{letter}}{\_\_\_\_} = \frac{1}{2}\ \underset{\text{number (with units)}}{\_\_\_\_}\ \underset{\text{number (with units)}}{\_\_\_\_}$$

Write a more general equation for the car using standard physics symbols (x, v_f, and t).

$$\underset{\text{letter}}{\_\_\_\_} = \frac{1}{2}\ \underset{\text{letter}}{\_\_\_\_}\ \underset{\text{letter}}{\_\_\_\_}$$

The area under a velocity vs. time graph represents the _____. (Hint: Check units!)
(physical quantity)