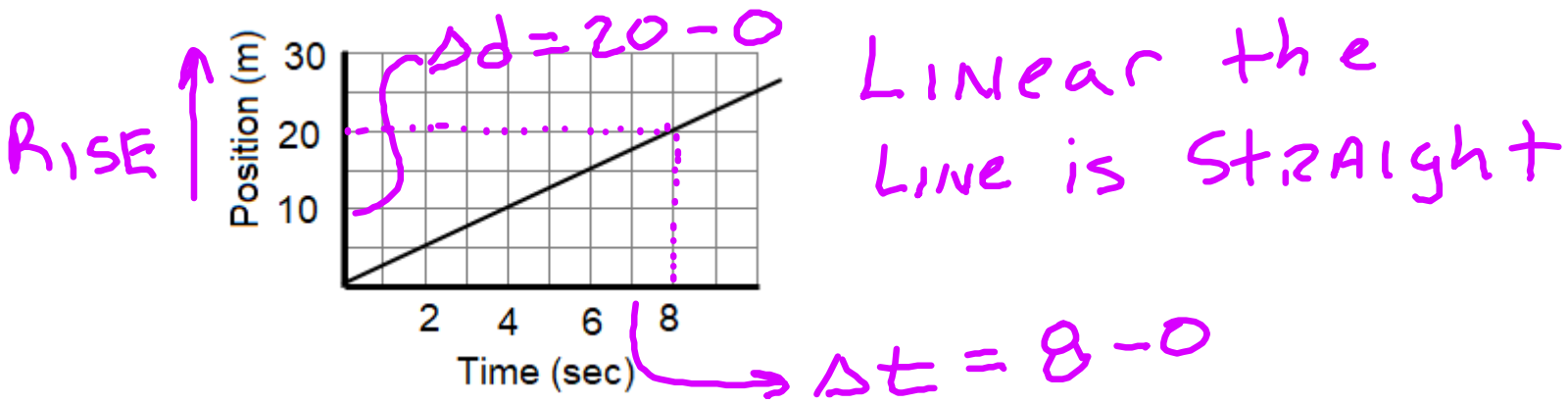
Linear Motion and Freefall
Physics Honors

Name _____
Period _____

Kinematics Introduction Part 1 - Slope of the line Reviewed

1. Does the graph show a linear or exponential (Curved) relationship between Position and Time?



2. Calculate the units for the slope of the line. What do these units tell us about the slope of a line on a position time graph?

$\frac{\Delta RISE}{\Delta RUN} = \frac{m}{SEC} = m/s = Velocity$

3. Is the object speeding up, slowing down or moving at a constant ~~speed~~ v? How do you know?

CONST. Because Graph is Linear.

4. Write the slope equation for the line and calculate the slope of the line:

$\frac{\Delta d}{\Delta t} = \frac{20}{8} = 2.5\ m/s$

5. Write a general equation for this relationship using the following physics variables:
d = displacement
v = velocity
t = time

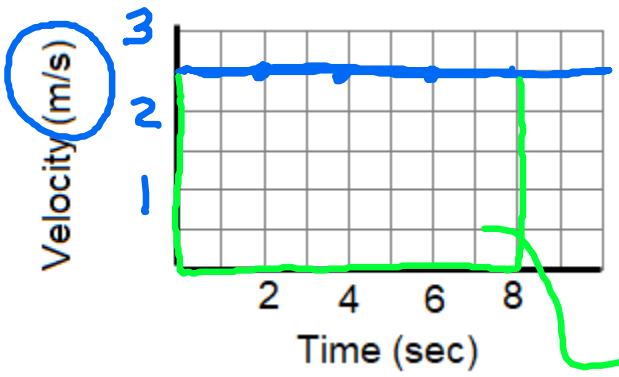
$y = mx + b$ Math

Physics $d = Vt$

d V
.T

Kinematics - Slope of the line Part 2 – The velocity – time graph

1. On the graph below, draw the velocity vs. time graph from number 1 above. Label the axes.



Calculate the slope of the line with units.

$m = \frac{\Delta v}{t} = 0$

ARE A

2. What are the units of the slope of the velocity vs. time graph and what does this tell you?

$\frac{\Delta v}{t} = \frac{m/s}{s} =$ Acceleration

3. Write the definition of acceleration in words and equation form, using the graph from the graph above.

$a = \frac{\Delta v}{\Delta t}$ Change in Velocity Per Time

4. Calculate the area under the curve and its units, what does this represent?

$A = h \cdot B = (2.5\ m/s)(8\ s) = 20\ \frac{m}{s} \cdot s$ d = 20 m

5. Write a general equation for this relationship using the following physics variables:
   d = displacement
   v = velocity
   t = time

$d = h \cdot B$

$d = v \cdot t$