Name _____

How Fast? (p. 43 – 47)

I. Velocity

1. **What two components are needed to determine how fast an object is moving?**

   1. Displacement Δd 2. Time Interval Δt

2. **Write out the formula for slope in terms of displacement (*d*) and time interval (*t*).**

   Slope = $\frac{\text{Rise}}{\text{Run}} = \frac{\Delta d}{\Delta t} = \frac{(d_f - d_i)}{(t_f - t_i)}$

3. **A steeper slope on a position-time graph indicates a ~~slower~~ faster moving object.**

   Steeper slope = Greater displacement

   Circle One : True (False)

4. **When Δd gets larger, the slope gets** larger.

   When the Δt gets larger, the slope gets smaller.

   p. 43

5. **Define the term average velocity.**

   Sprints - (1) Acceleration (2) Maintain

   Average Velocity – ratio of the change of position to the time interval during which the change occurred (400 meter hurdles in 55 seconds)

   $\bar{v} = 7.27$ m/s

   Direction Needed

   N, S, E, West

6. **Write out the formula for determining average velocity.**

   $\bar{v} \equiv \frac{\Delta d}{\Delta t} = \frac{d_f - d_i}{t_f - t_i}$

   ≡ ← left-hand side of equation defined by right-hand side

7. **Average velocity is equal to the slope on a position-time graph.**

   Circle One : (True) False

8. **Define the term average speed.**

   Average Speed – how fast the object is moving (magnitude without direction)

9. **The absolute value of the slope of a position-time graph indicates average speed.**

   Circle One : (True) False

   p. 44

10. **An object moving in a negative direction will produce a negative displacement.**

    Circle One : (True) False

    Running bases backwards!

Name _____

II. Instantaneous Velocity

1. **What are five things that could happen during a time interval of a moving object?**

Interstate Highway → 1. Speed of object remains the same.
Airplane taking off → 2. Speed of object increases.
Running hills? → 3. Speed of object decreases.
End of races? → 4. Object stops (Run through finish line.)
Running back in football → 5. Object changes direction.

2. **Define the term instantaneous velocity.**

Instantaneous Velocity – speed and direction of an object at a particular instant (Symbol = v)
(Speedometer Reading)

III. Average Velocity on Motion Diagrams

1. **Displacement and average velocity exhibit an ~~inverse~~ proportionate relationship.**

Circle One : True (False)

↑ velocity = ↑ displacement

2. **With regards to average velocity, what two components can be indicated on a motion diagram?**

Speed = scalar

1. Direction 2. Magnitude

3. **What color is used to indicate velocity vectors on motion diagrams?**

Red

Displacement vectors = Green

4. **Write out the formula for a linear relationship between two variables.**

$y = mx + b$

5. **What is each variable equivalent to on a position-time graph?**

y = d (position)
m = $\bar{v}$ (velocity)
x = t (time)
b = d_i (initial position)

p. 47

6. **Write out the formula for motion for average velocity.**

$d_f = \bar{v}t + d_i$ $y = mx + b$