

Chapter 4 Review Sheet
 Integrated Science - Physics & Engineering Design

Name _____ Period _____

1. Define the following terms:

a. Speed

HOW QUICKLY AN OBJECT MOVES
 (RATE OF CHANGE OF POSITION)

b. Velocity

SPEED + DIRECTION OF OBJ.

c. Acceleration

RATE OF CHANGE OF VELOCITY

d. Vector quantity

HAS BOTH SIZE + DIRECTION

e. Free fall

OBJ. W/ ONLY GRAVITY FORCE ACTING ON IT

f. Strong relationship between variables

LARGE CHANGE IN 1 VARIABLE CAUSES A LARGE CHANGE IN OTHER VAR.

g. Weak relationship between variables

LARGE CHANGE IN 1 VARIABLE CAUSES A SMALL CHANGE IN OTHER VARIABLE

2. What is the difference between average speed and instantaneous speed?

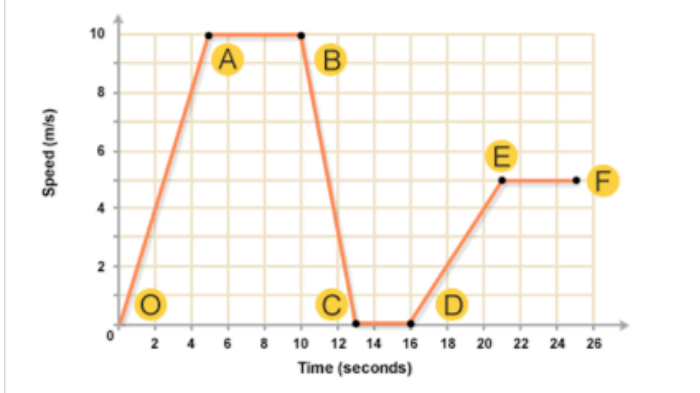
Ave speed = total dist. /

inst. speed = speed @ 1 moment

3. What is the difference between speed and velocity?

VEL. HAS DIRECTION

4. Refer to Figure 1:



a. What segment(s) of the graph show zero velocity?

C-D

b. What segment(s) of the graph show zero acceleration?

A-B, C-D, E-F

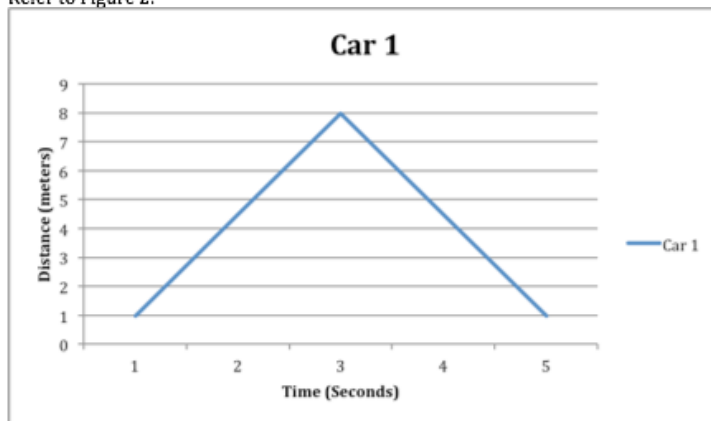
c. What segment(s) of the graph show negative acceleration?

B-C

d. What segment(s) of the graph show positive acceleration?

O-A D-E

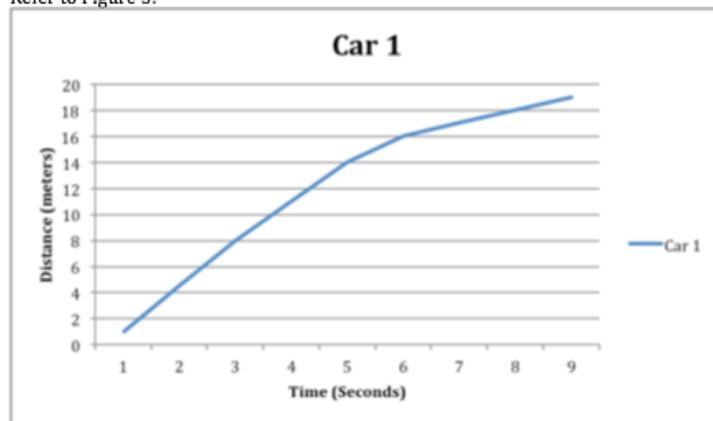
5. Refer to Figure 2:



a. Is the car accelerating? Why or why not?

YES - DIR. CHANGING

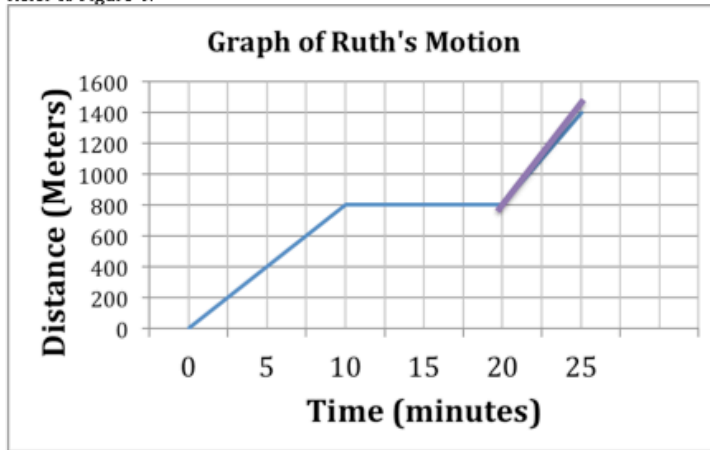
6. Refer to Figure 3:



a. Is the car accelerating? Why or why not?

YES, SLOWING DOWN

7. Refer to Figure 4:



a. Is Ruth traveling at a constant velocity? Why or why not?

NO - SPEED CHANGES

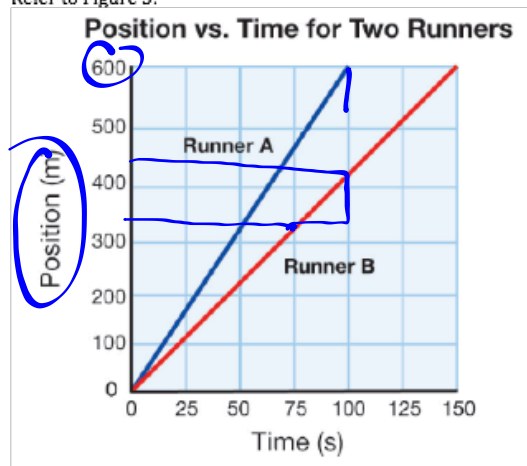
b. What is indicated about Ruth's motion between 10 and 20 ^{min.} ~~seconds?~~

0 VELOCITY

c. During what time is Ruth moving the fastest?

20-25 min

B. Refer to Figure 5:



a. Are the runners accelerating? Why or why not?

NO - constant speed

b. Which runner is moving fastest? How do you know?

A - slope steeper

c. How far has each runner gone in 100 seconds?

A - 600 m B = 425 m

For each problem below, carry out these steps:

- Write the **formula** that you will use to solve the problem
- Re-write the formula, substituting known values **with units**
- Write the answer using the proper **unit**
- Check you answer for the proper number of **significant figures**
- Check you work for accuracy

9. A bicyclist travels 30.0 km in 1.8 hours. What is the cyclist's average speed?

$$s = d/t = \frac{30.0 \text{ km}}{1.8 \text{ hr}} = \underline{17 \text{ km/hr}}$$

10. How much time would it take for the sound of thunder to travel 3,000 meters if sound travels at a speed of 330 m/s?

$$t = d/s = \frac{3,000 \text{ m}}{330 \text{ m/s}} = 9 \text{ s}$$

11. A snail moves about 0.25 meters per minute. How many meters can the snail cover in 35 min?

$$d = s \times t = 0.25 \text{ m/min} \times 35 \text{ min} = \underline{8.8 \text{ m}}$$

12. A motorcycle slows from 100 m/s to 10 m/s in 5 seconds. What is the acceleration of the motorcycle?

$$a = \frac{v_f - v_i}{t} = \frac{10 \text{ m/s} - 100 \text{ m/s}}{5 \text{ sec}} = \frac{-90 \text{ m/s}}{5 \text{ s}} = -20 \text{ m/s/s}$$

13. A jet starts at rest and after 10 seconds is moving at 400 m/s. What is the acceleration of the jet?

$$a = \frac{v_f - v_i}{t} = \frac{400 \text{ m/s} - 0}{10 \text{ sec}} = 40 \text{ m/s/s}$$