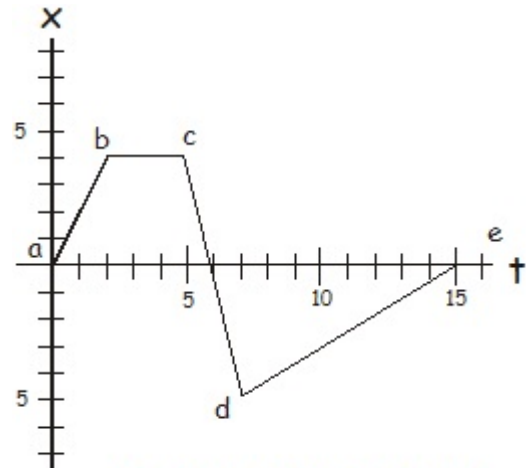# Worksheet #2

KINEMATICS

Name: _____

1. A position vs time graph is shown to the right. Please analyze the graph and determine the following:
(a) The speed of the object from b → c, (b) the speed from c → d, (c) the speed from d → e, (d) the times t when the speed of the object is zero, and (e) the points where the direction of the object had to change (if any).

Position Time Graph

2. You walk down the sidewalk to the east for 8.0 min at a speed of 1.2 m/s. You reach a busy street and have to stop. You remain at rest for 2 minutes. The traffic dies down, so you run across the street at constant speed. The street is 12 m wide and it takes you 1.5 s to cross it. You immediately slow down to your regular 1.2 m/s walk speed and proceed for 2 min. You suddenly discover that your plush ducky fell off your backpack. You immediately turn around and run back to the intersection you just crossed. You run at a constant speed of 6.5 m/s. Make a distance vs time graph for your motion.

3. A race car accelerates at a rate of 15.6 m/s^2. If it starts from rest, how much time till it is traveling at 325 km/h?

4. A truck falls off a cliff. If the cliff is 33.5 m high, how much time for the truck to reach the bottom?

5. You toss a ball straight up in the air, it goes up, comes down, and you catch it. If it took 5.6 s from when you threw it to when you caught it, how high did it go?

6. The speed of sound is 344 m/s. You have built a really fantastic car that can really go fast. If the car can accelerate at 22.4 m/s^2, how much time till you reach the speed of sound?   How many kilometers will you travel before you reach that speed?

7. In 1947 Bob Feller, a pitcher for the Cleveland Indians, threw a baseball across the plate at 98.6 mph or 44.1 m/s. For many years this was the fastest pitch ever measured. If Bob had thrown the pitch straight up, how high would it have gone?

8. You are on top of a building that is 75.0 m tall. You toss a ball straight up with an initial velocity of 33.8 m/s. How high does the ball travel? It goes up and then falls down to the ground below. How much time is it in the air?