**More Challenging Kinematics Problems**

**Type 1:** Lack of Information **OR** Interpreting Solutions

 To solve these you have to use CONTEXT and ideas learned in class, like: projectile SYMMETRY or constants like the acceleration of gravity on Earth’s surface.

**Ex. A)**

 A dog jumps straight up with a velocity of 2.7m/s. How long is it in the dair?

|  |  |
| --- | --- |
|  | How do we know this? |
| ­vi= |  |
| vf= |  |
| a= |  |
| d= |  |
| t= |  |

**Ex. B)**

 A ball is hit into left field and has an initial vertical velocity of 5.2m/s upward. Jim takes 7s to get to the ball. Does he catch it?

**Type 2:** Two Motion Problems

 These problems have two separate motions. Either one object moves one way, then another, OR two objects are moving at once. This type of problem doesn’t have one set way to solve the problem and will rely on your problem solving abilities.

*Helpful Steps:*

1. Sketch the situation
2. Split the problem into two motions.
3. Identify values that are the same OR relationships between the two values.
4. Use your critical thinking and problem solving skills to work your way towards a solution.

**Ex. C)** Easier 2-motion problem

 Graham sprints 100m, starting at rest, and accelerates at a rate of 2m/s2. After his sprint, Graham walks back to his starting point walking at a constant 1.7m/s. How long does it take Graham to do a sprint, then walk back to the starting point?

**Ex. D)** Harder 2-motion problem

 Jasmine is speeding, going 90km/h in a 50km/h zone. A police ghost car at rest begins to accelerate the moment Jasmine passes it. If it accelerates at a rate of 2.8m/s2, how long does it take the officer to catch up with Jasmine?

**Ex. E)** Actually Hard 2-motion problem

 Thomas is climbing up a 150m cliff at a constant pace of 1.2m/s. Ally is on the top of the cliff, and the moment Thomas starts climbing she drops a spider. How high off the ground is Thomas when he encounters the spider?