Physics for Mascians

MOTION WITH CONSTANT ACCELERATION

1) Decide on the origin and positive direction of a coordinate system. A sketch is often helpful.

2) Collect the given input data such as initial and final positions, velocities and accelerations. Take care that the units are consistent. (For example, if position is in m, the velocity should be in m/s and the acceleration in m/s^2) Choose the signs of the input data in accordance with your choice in no. 1

3) Write down the equations of motion in terms of this input data.

$$x = x_o + v_o t + \frac{1}{2} a t^2$$

$$v = v_o + at$$

$$v^2 = v_o^2 + 2a(x - x_o)$$

Note which quantities are known and which are unknown.

4) Solve the equations, which may be simultaneous in several unknowns, for the desired quantities.

5) Check that your solution makes physical sense by reference to the coordinate system and sketch of 1. For example, if your coordinate system's positive axis points upward, a ball thrown upward falls back to earth with a negative velocity.