

"KEYS" to problem solving Kinematics problems:

- Use the system (write it out, follow step-by-step)

- Variable inventory

1. Variable expressions are ok
2. Break down vectors & add to inventory
3. Look to fill in all blanks (unless you're darn sure you don't need a variable)

- In general, unless stated otherwise, you can assume:

1. $a_y = 9.8 \text{ m/s}^2$ down $\rightarrow v_{oy} \neq v_y$

2. $a_x = 0$

3. $v_{ox} = v_x$ \rightarrow because ...

4. Ignore initial and final accelerations

5. At the top of an object's vertical path, $v_y = 0$

6. If an object's final position is the same height as its initial position, then $y_0 = y$ (often \emptyset)

Once your inventory is done:

1. Usually $t_x = t_y$ (projectile)
2. Often, you can relate position
($x_1 = x_2$ for two moving objects)
3. Sometimes we need new variables to talk about things that happened before or after the problem
4. Sometimes there's an offset to the relationship ($t_1 = t_2 + 3$;
 $x_1 = x_2 + 12$)
5. In projectile motion problems, it's often helpful to start with the "y" variables

usually
 $v_1 \neq v_2 \rightarrow$

Additionally...

- Break problems up if acceleration isn't constant (the racer...)

