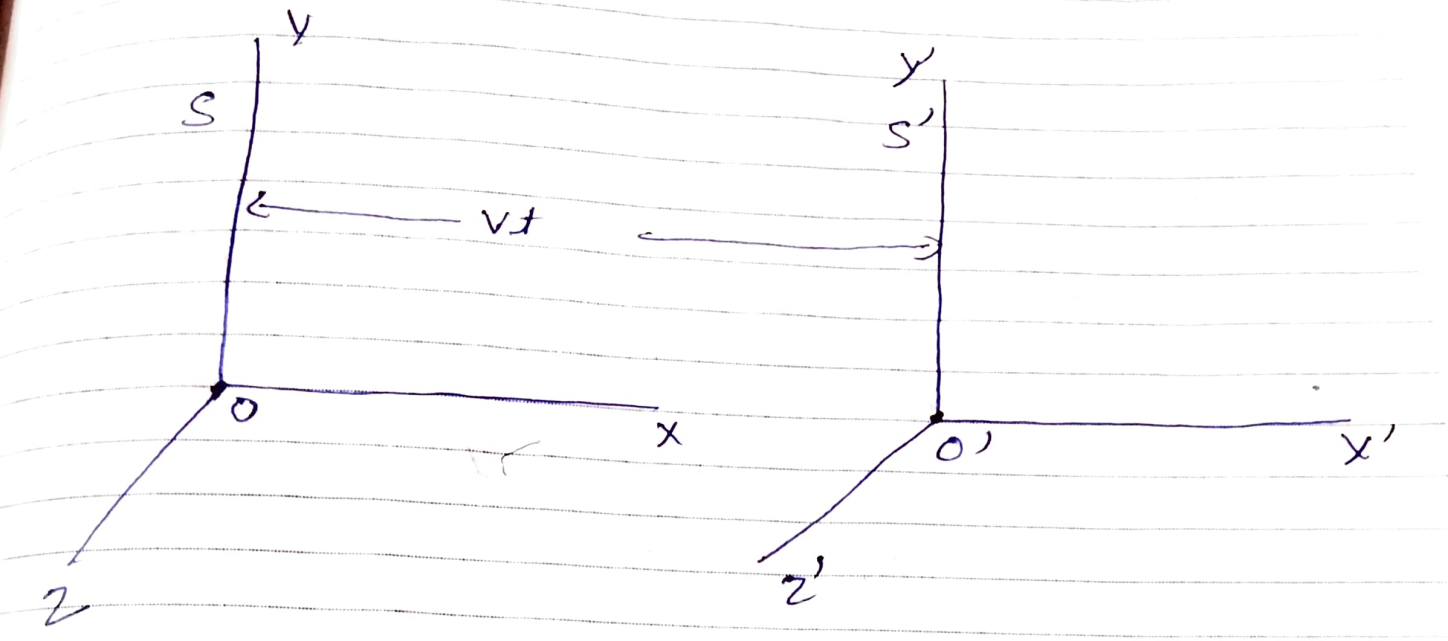
9/4/21

GALILEAN TRANSFORMATION



consider two inertial frame of reference S (O, x, y, z) and S' (O', x', y', z')

At time t = 0, O and O' coincide with each other.

Suppose S' frame with observer O' moves with the velocity V along positive x-axe

some event occurs at a point P whose space co-ordinates and time co-ordin are recorded by both the observers in their respective inertial frames.

The observes O in S frame of referen records co-ordinates (x, y, z) and tim for the event P is S-frame.

The observer O' in S' frame of reference records co-ordinates (x', y', z') and time t' for the same event at P in S' frame.

According to classical physics, motion does not affect the length.

So we have:

$$x' = x - Vt$$

$$y' = y$$

$$z' = z$$

Also according to the concept of absolute nature or universal nature of time we have

$$t' = t$$

Then the following set of equation

$$x' = x + Vt$$

$$y' = y$$

$$z' = z$$

$$t' = t$$

is called the Galilean transformation equation