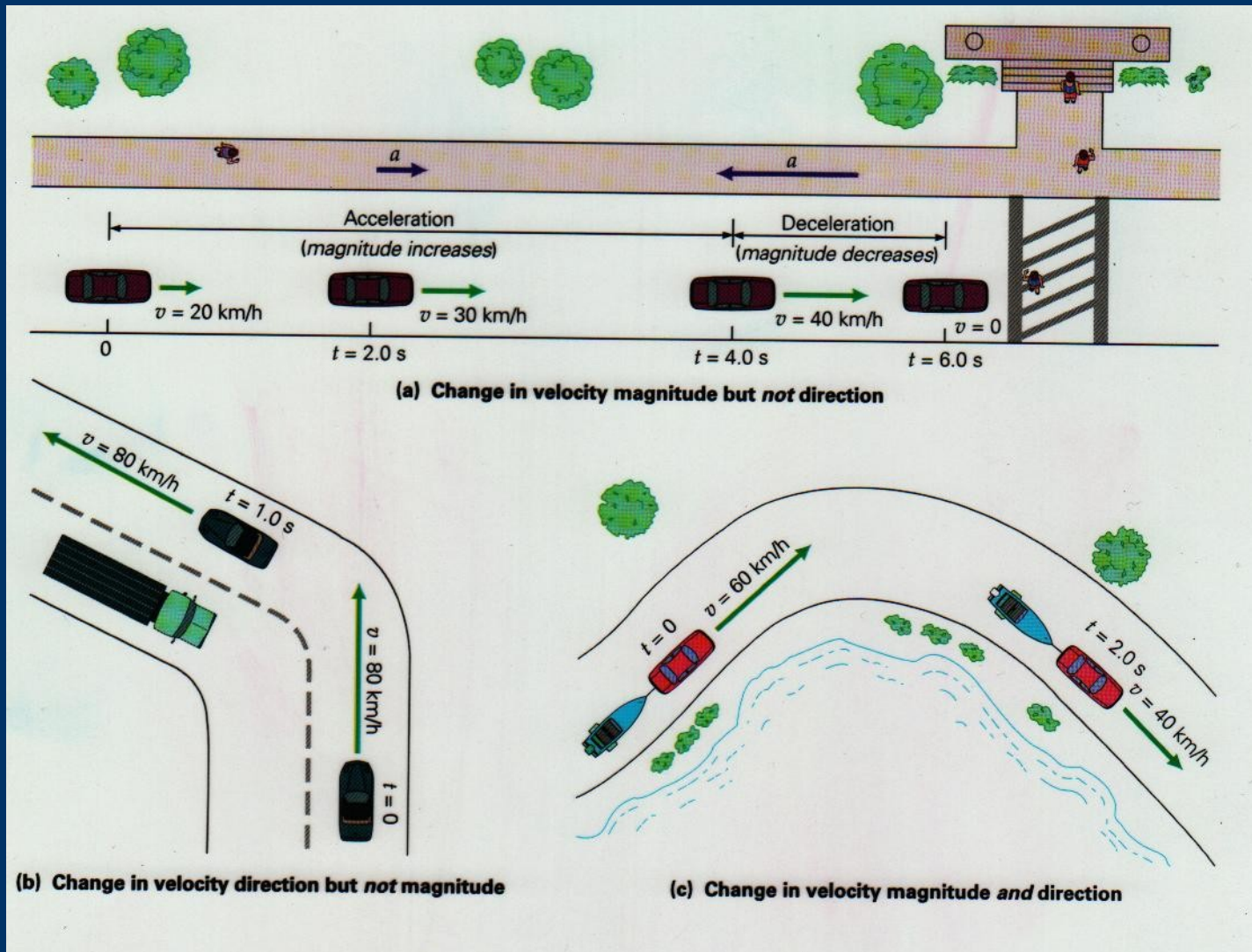
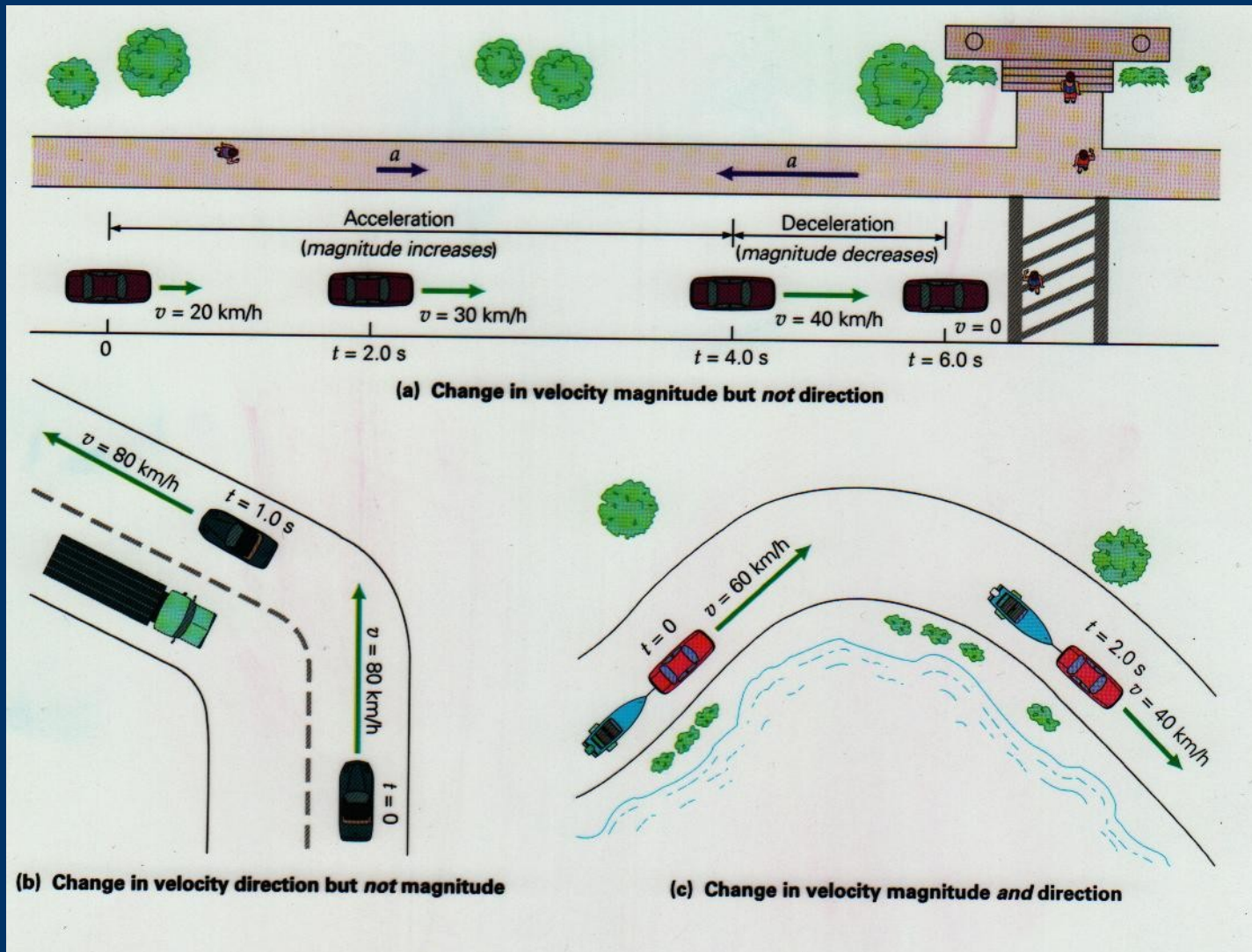


# PHYS 2311 Week 3 - Motion in 1, 2, and 3 dimensions.



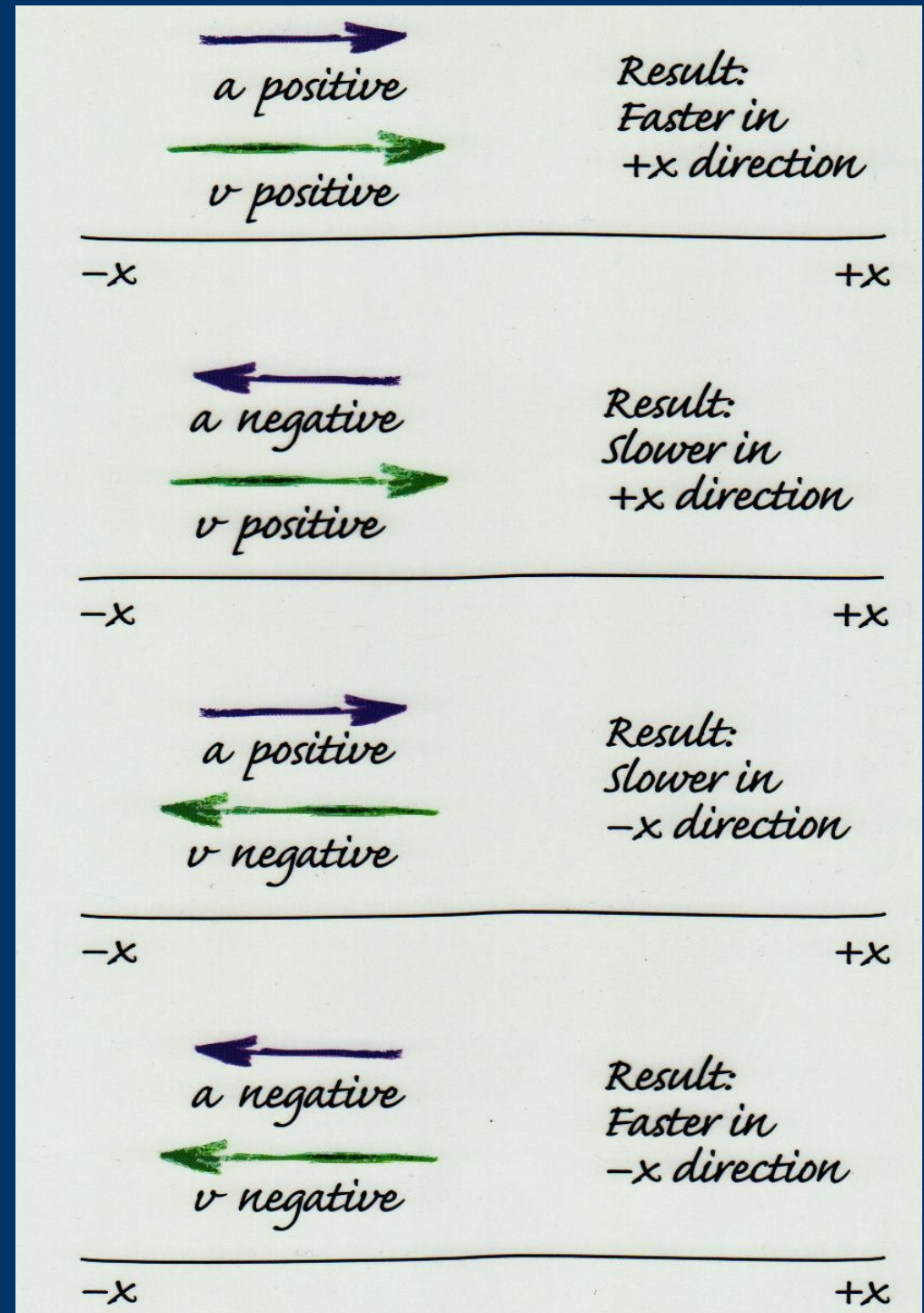
# Top: Motion in 1D

## Bottom: Motion in 2D.



## Motion in 1D.

The sign of acceleration and velocity is used to indicate the direction of these vectors.

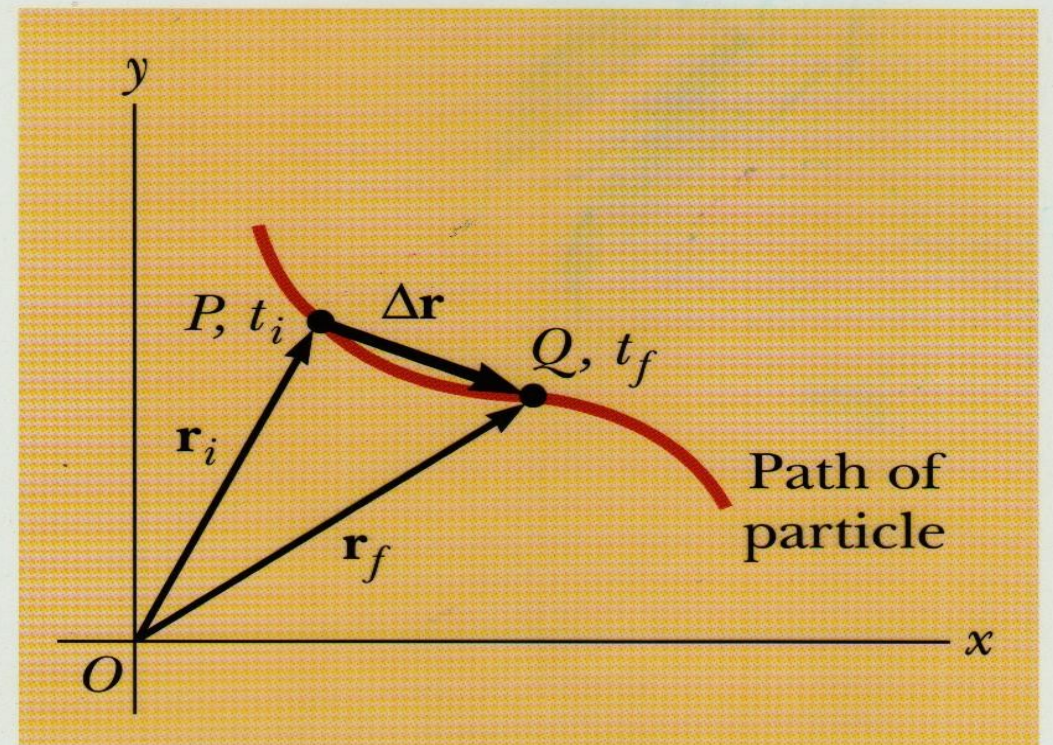
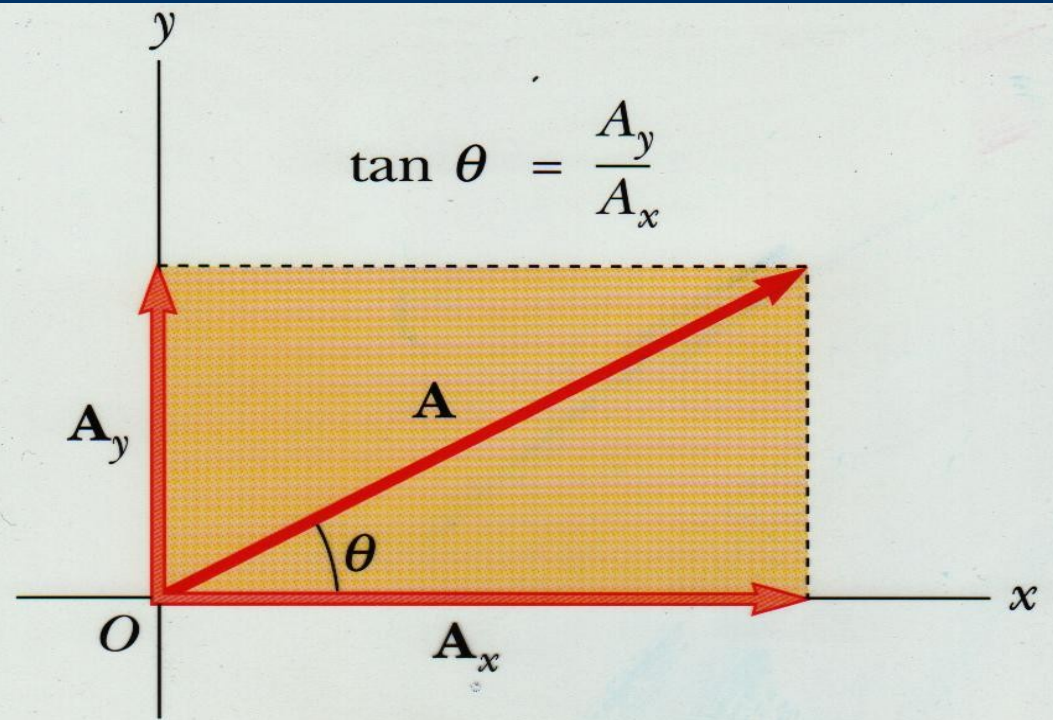




## Motion in 2D.

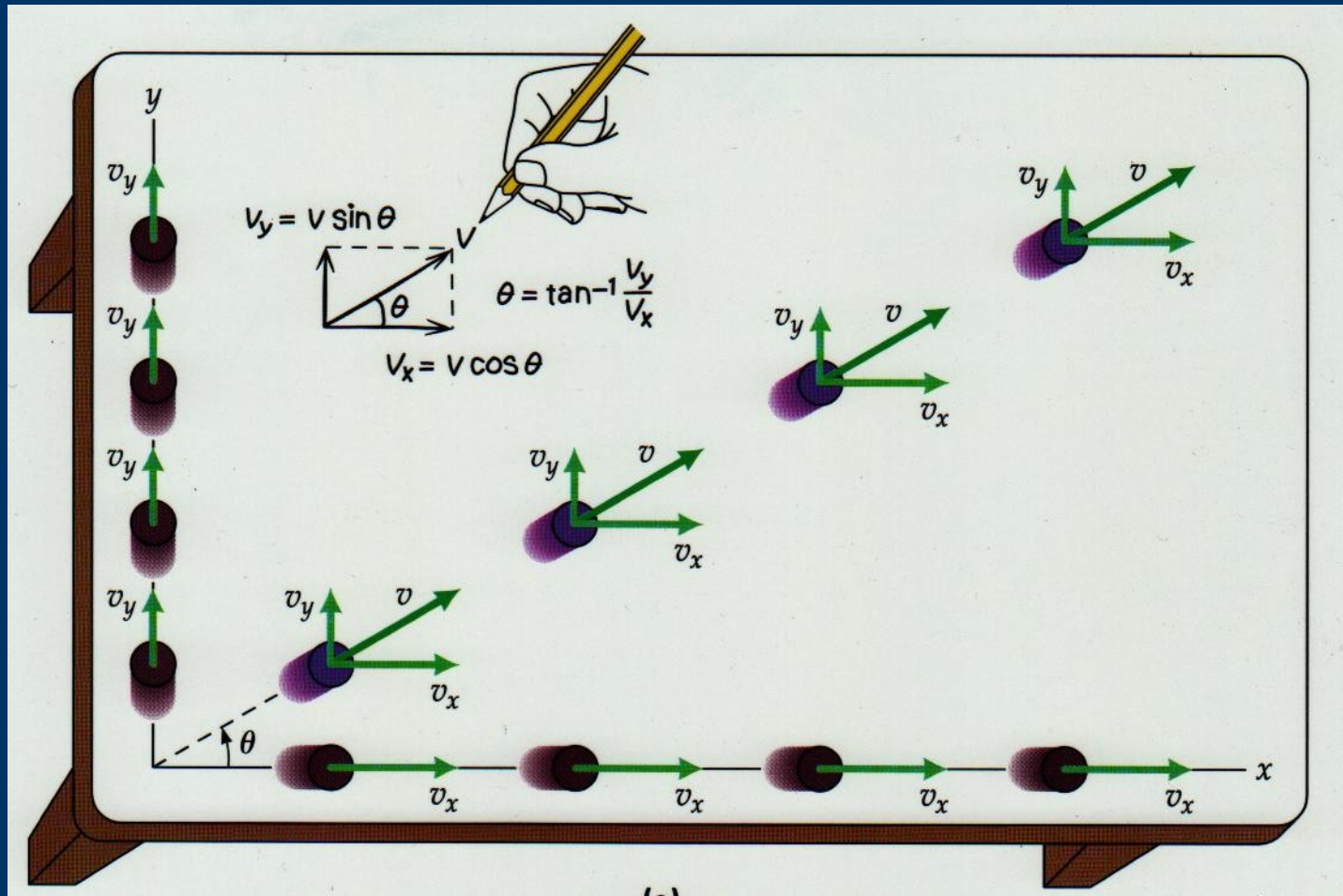
Top: position vector in 2-D.

Bottom: change of a position vector  $\mathbf{r}$  gives a displacement  $\Delta\mathbf{r}$ .



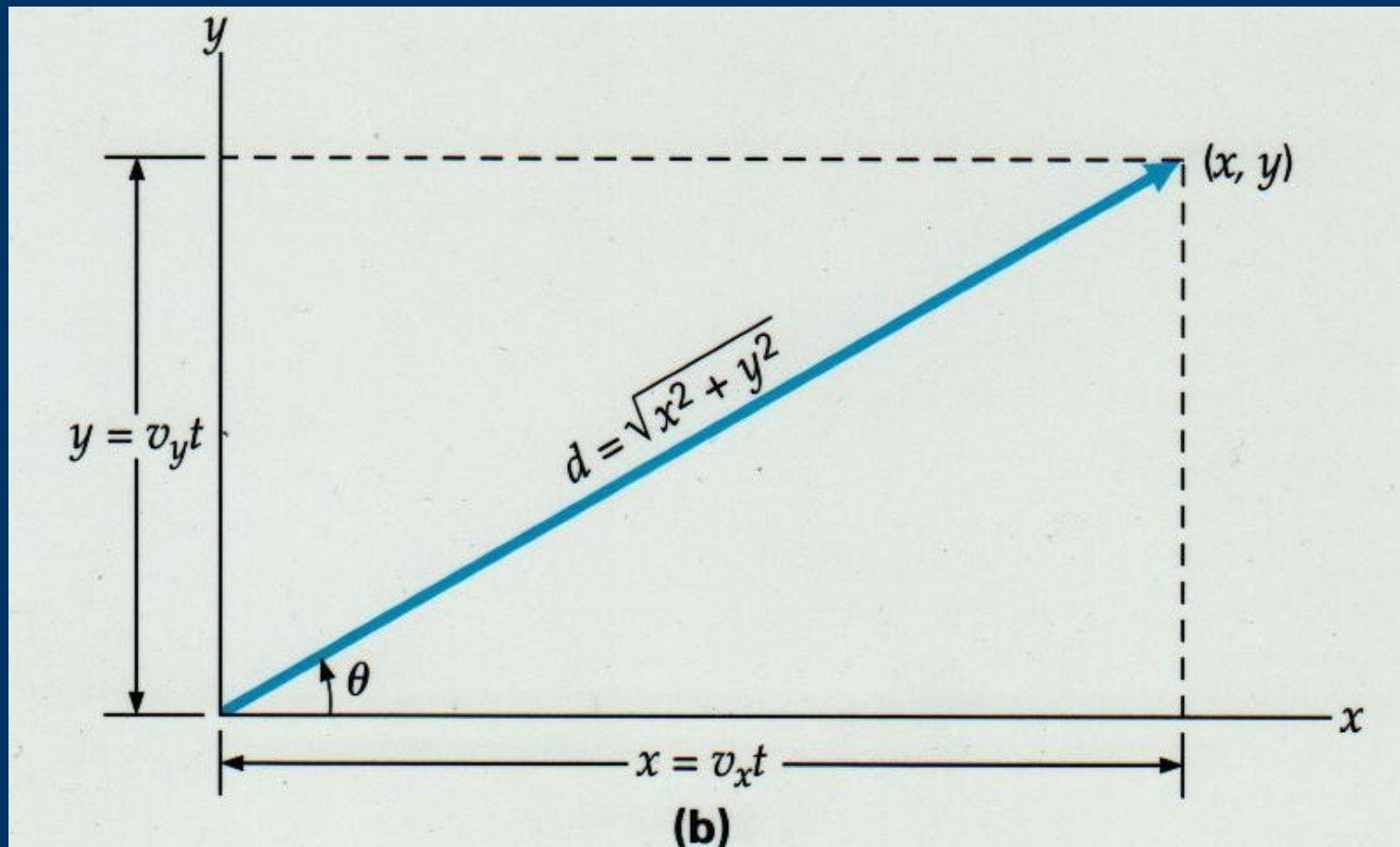
# 1D Motion expressed with 2 dimensions.

## Velocity components in 2-D.



## Motion in 2D.

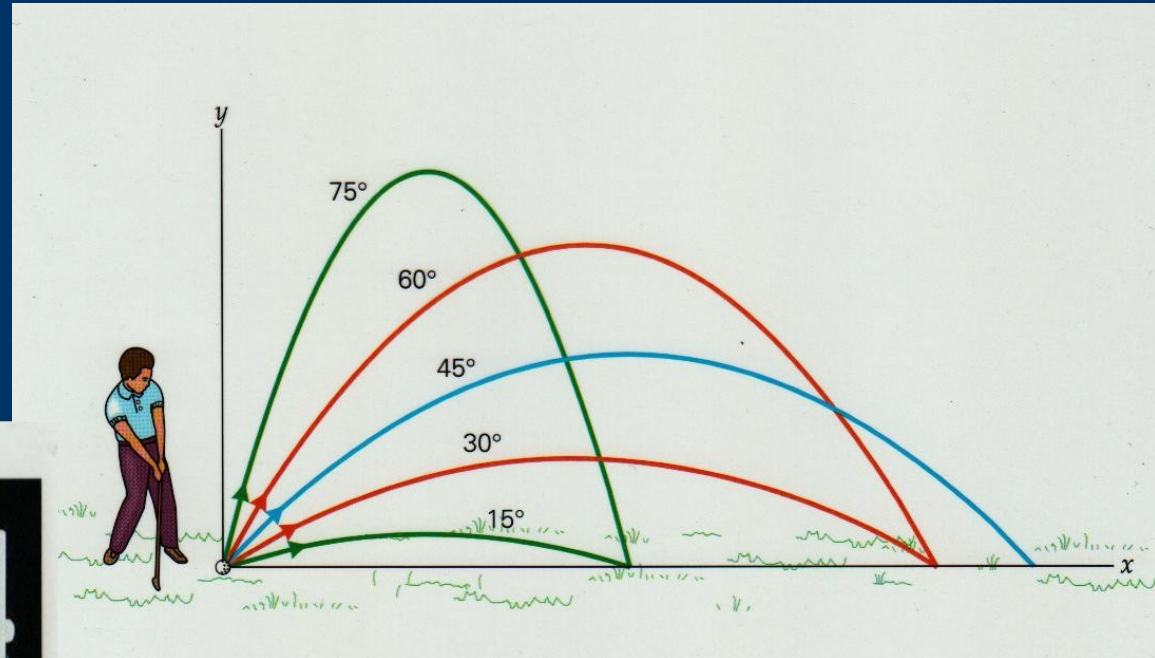
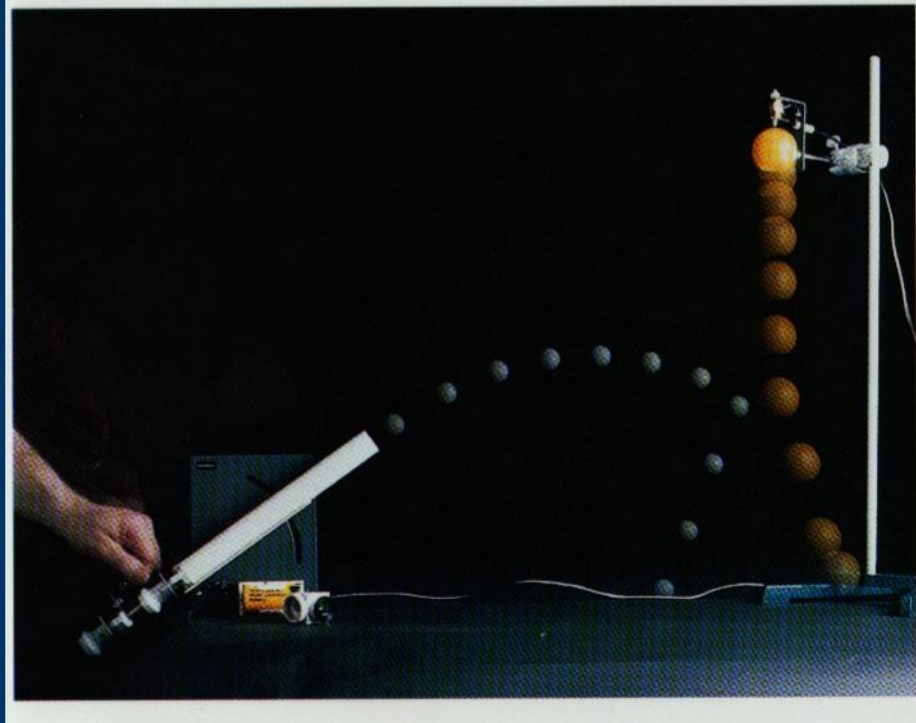
### Relation between displacement components and velocity components.





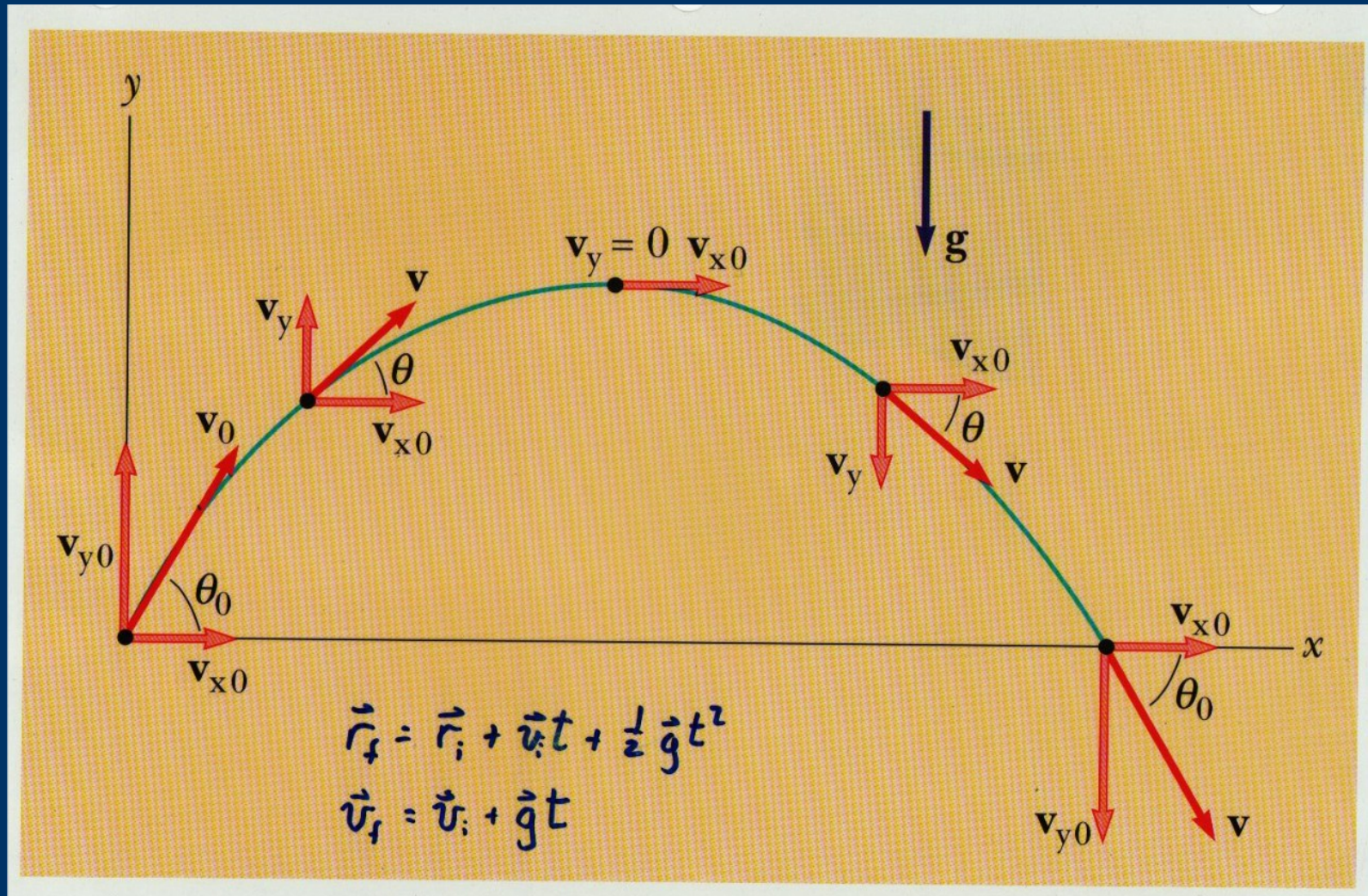
# Motion in 2 dimensions.

Uniform downward acceleration leads to parabolic trajectories ...



## Motion in 2 dimensions.

Trajectories: position vector is a sum of 3 vectors.  
(Velocity vector is a sum of 2 vectors.)





# PHYS 2311 Motion in 2 dimensions.

Trajectories: parabolas distorted by air resistance.

