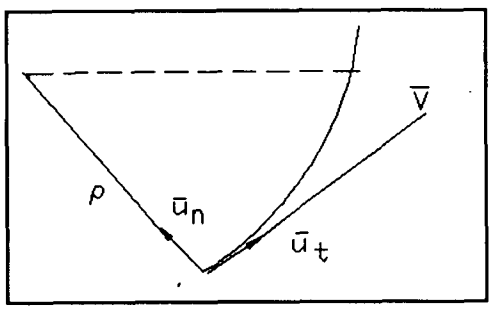
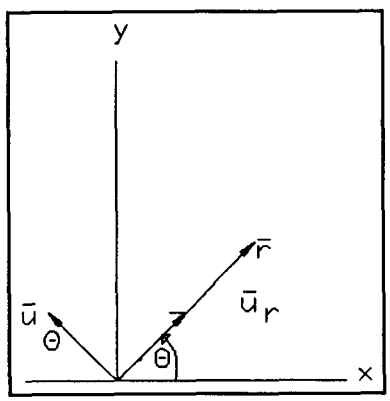
SUMMARY DYNAMICS MODULE N2

SUBJECT	EQUATION	DISCUSSION
3-D and 2-D Motion	$\bar{v} = \frac{d\bar{s}}{dt}$ $\bar{a} = \frac{d\bar{v}}{dt}$ $\bar{v} = v_x\bar{I} + v_y\bar{J} + v_z\bar{K}$ $\bar{a} = a_x\bar{I} + a_y\bar{J} + a_z\bar{K}$	Displacement, velocity and accleration may be resolved into orthogonal components.
Projectile Motion	$v_x = v \cos \theta_o$ $x = x_o + v_o \cos \theta_o t$ $v_y = v_o \sin \theta_o - gt$ $y = y_o + v_o \sin \theta_o t - 1/2gt^2$	An example of projectile motion occurs in a gravitational field.
Tangential and Normal	$\bar{a} = \frac{dv}{dt}\bar{u}_t + \frac{v^2}{\rho}\bar{u}_n$ $\bar{a} = \dot{v}\bar{u}_t + \frac{v^2}{r}\bar{u}_n$	ρ - radius of curvature



Radial and Transversel Components	$\bar{v} = \frac{dr}{dt}\bar{u}_r + r\frac{d\theta}{dt}\bar{u}_\theta$ $\bar{a} = \left[\frac{d^2r}{dt^3} - r\left(\frac{d\theta}{dt}\right)^2\right]\bar{u}_r$ $+\left[2\frac{dr}{dt}\frac{d\theta}{dt} + r\frac{d^2\theta}{dt^2}\right]\bar{u}_\theta$ $\bar{v} = \dot{r}\bar{u}_r + r\dot{\theta}\bar{u}_\theta$ $\bar{a} = (\ddot{r} - r\dot{\theta}^2)\bar{u}_r + (2\dot{r}\dot{\theta} + r\ddot{\theta})\bar{u}_\theta$	



WORDS TO KNOW MAJOR MODULE 2

1. Curvilinear Motion - occurs when a particle moves along in a curve rather than a straight line.

2. Fixed Frame of Reference - this is a frame of reference where the frame is attached to the earth.

3. Projectile Motion - this is motion where the object moves in a gravitational field.

4. Polar Coordinates - where the position of a particle is expressed by its "Polar Coordinates" r and θ .

5. Range - this refers to the horizontal distance that an object travels; usually concerned with projectile motion.

6. Centrifugal Force - this is the force associated with the acceleration in the normal direction. It represents the tendency of a particle to leave its curved path.