CIRCULAR MOTION

Curvilinear motion is the motion of a particle moving along a curve

The velocity of the particle is tangential to the path. However, the acceleration is not usually tangential to the path

PROJECTILE MOTION

Initially, before the projection of the particle,

x\_o = y\_o = z\_o = 0

All at the origin

a\_x = 0, a\_y = -g, a\_z = 0

When projected,

The horizontal motion in a projefctile motion is uniform. Therefore, there is no acceleration

v\_y = u\_y – gt

x = {u rsub x}{t}

The motion in vertical is uniformly accelerated. Therefore there is a constant acceleration of (-g)

QUESTIONS ON PROJECTILES

VELOCITY VECTOR

The velocity vector of a particle is tangential to the path of the particle. Acceleration vector is not tangential

The velocity is tangential to the path and therefore will also have its unit vector (e\_t) tangential to the path

When two particles P and P` are moving, the relative velocity between them is

Also comparing their unit vectors

The angle between these two tangential unit vectors is

The relationship between the tangential unit vector and the normal unit vector is given by the relation

lim from {} {{}{e\_t}} = {e\_n}

From the above, it can be seen that the velocity vector that is tangential is.

From here, applying the product rule,

e\_n = {d{e\_t}} over {d{%theta}}

{dS over dt} = v

, the tangential acceleration reflects the change in speed of the particle

, the normal acceleration reflects the change of direction