

IV. Newton's Laws of motion

(A) 1st Law: Inertia

(B) 2nd Law: $\Sigma F = ma$

(C) 3rd Law: Action/Reaction

(D) separate x & y components & apply Newton's 2nd Law.

V. Circular motion

(A) $(a_c / F_c) \perp v$

(B) $a_c = \frac{v^2}{r}$ inward

(C) F_c is necessary to travel in a circle

(D) $2\pi r = vT$

(E) $F_c = \frac{mv^2}{r}$ (+ is inward, - if outward)

(F) $a_t = \frac{d|v|}{dt} = r\alpha$

1. solve for a_t use constant acc. eq & $s = R\theta$.

2. use FBD & $\Sigma F_c = ma_t$



(G) Orbits

1. $L_1 = L_2$

2. $E_1 = E_2$

3. $F_c = F_g \Rightarrow \frac{mv^2}{r} = \frac{GM_1m_2}{r^2}$