

IB Physics HL Notes

Motion in Fields

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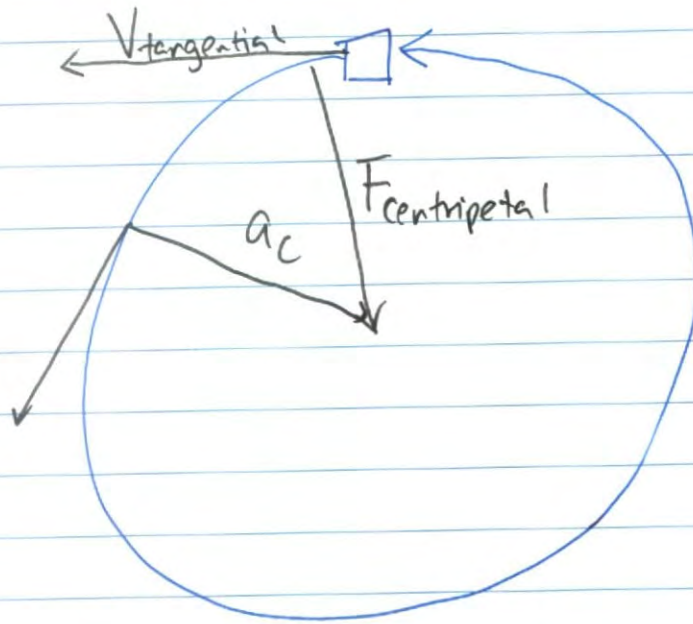
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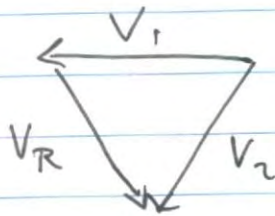
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Uniform Circular Motion



Maintaining constant angular speed

revs^{-1} degs^{-1} rads^{-1}



- Rotation - on its own surface
- Revolution - externally
- Axis - a line of stationary points.

REVOLUTION

Angular speed: revs^{-1}

tangential (linear) speed: ms^{-1}

$\left(\frac{2\pi}{T} \text{ rad}\right)$ angular velocity: rads^{-1} ω ω ω

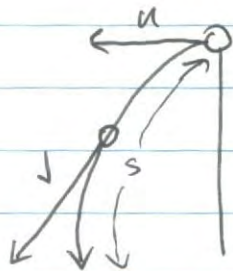
period: s

frequency: $s^{-1} = \text{Hz}$

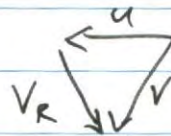
centripetal force F_c : $\# \text{ N} = \frac{mv^2}{r}$

mass of revolving obj.
tan. vel.
radius

centripetal acceleration: $\frac{v^2}{r}$



$$s = \theta r$$



Examples

- bodies in orbit (planets, moons, satellites)
- object on a string (conical pendulum)
- isolated point (us on earth, merry-go-round)
- vehicle on a track.