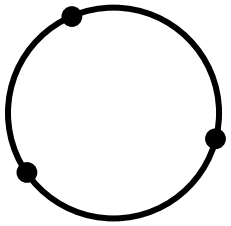
CONCEPT: INTRO TO UNIFORM CIRCULAR MOTION



- In Uniform Circular Motion (UCM), objects move in a *circular* path with _____.
  - $\vec{v}$ changes direction in UCM; $\vec{v}$ at any point is called the _____ velocity ($\vec{v}_T$).
  - $\vec{a}$ ("centripetal" = center-seeking) points towards _____ of the path ($\vec{a}_C$ or $\vec{a}_{rad}$).
  - R is the distance from the edge of the path to the center, or the _____ of the path.

a_c = ——— Units: [_____]

EXAMPLE: You move at constant 5 m/s when you turn into a circle of radius 10m. Calculate your centripetal acceleration.

PROBLEM: A ball travels on a frictionless circular track at 3m/s. The ball cannot have an acceleration greater than 1.5m/s^2 or it will go off the track. What is the smallest radius the circular track can have so that the ball stays on the track?

Circ. Motion
$a_C = \frac{v_T^2}{R}$

PROBLEM: The Moon travels in a circular orbit of radius **R = 3.85×10^8 m** around the Earth because of gravity. Because of the large distance, the centripetal acceleration of the Moon is only 0.0026m/s^2. How fast would the Moon be moving if it suddenly broke free of Earth's gravity and stopped orbiting?

Circ. Motion
$a_C = \frac{v_T^2}{R}$