EngineeringRise

Uniform circular motion

Formulas and units, JEE Main. Status: Reviewed on 2026-11-20.

Result	Formula	Units or note
Angular velocity	omega = d theta/dt = 2 pi/T = 2 pi f Valid when: dtheta/dt always; 2 pi/T and 2 pi f hold for uniform circular motion	rad/s
Linear and angular speed	v = omega r Valid when: circular motion, omega in rad/s	m/s
Period and frequency	T = 2 pi r/v = 1/f Valid when: uniform circular motion, constant speed v	s (Hz)
Centripetal acceleration	a_c = v^2/r = omega^2 r = v omega Valid when: uniform circular motion; v, omega in SI units	m/s^2
Arc and chord	arc = r theta; chord = 2 r sin(theta/2) Valid when: theta in radians, r the circle radius	m
Unit conversions	1 rpm = 2 pi/60 rad/s; 1 km/h = 1/3.6 m/s	rad/s (m/s)

Full lesson with worked examples:
https://www.engineeringrise.in/learn/learn/jee-main/physics/kinematics/uniform-circular-motion

EngineeringRise is an unofficial study site. It is not affiliated with NTA, the IITs, BITS, VIT, SRM or any exam body.