

Glossary

angular velocity

ω , the rate of change of the angle with which an object moves on a circular path

arc length

ΔS , the distance traveled by an object along a circular path

banked curve

the curve in a road that is sloping in a manner that helps a vehicle negotiate the curve

center of mass

the point where the entire mass of an object can be thought to be concentrated

centrifugal force

a fictitious force that tends to throw an object off when the object is rotating in a non-inertial frame of reference

centripetal acceleration

the acceleration of an object moving in a circle, directed toward the center

centripetal force

any net force causing uniform circular motion

Coriolis force

the fictitious force causing the apparent deflection of moving objects when viewed in a rotating frame of reference

fictitious force

a force having no physical origin

gravitational constant, G

a proportionality factor used in the equation for Newton's universal law of gravitation; it is a universal constant—that is, it is thought to be the same everywhere in the universe

ideal angle

the angle at which a car can turn safely on a steep curve, which is in proportion to the ideal speed

ideal banking

the sloping of a curve in a road, where the angle of the slope allows the vehicle to negotiate the curve at a certain speed without the aid of friction between the tires and the road; the net external force on the vehicle equals the horizontal centripetal force in the absence of friction

ideal speed

the maximum safe speed at which a vehicle can turn on a curve without the aid of friction between the tire and the road

microgravity

an environment in which the apparent net acceleration of a body is small compared with that produced by Earth at its surface

Newton's universal law of gravitation

every particle in the universe attracts every other particle with a force along a line joining them; the force is directly proportional to the product of their masses and inversely proportional to the square of the distance between them

non-inertial frame of reference

an accelerated frame of reference

pit

a tiny indentation on the spiral track moulded into the top of the polycarbonate layer of CD

radians

a unit of angle measurement

radius of curvature

radius of a circular path

rotation angle

the ratio of the arc length to the radius of curvature on a circular path: $\Delta\theta = \frac{\Delta s}{r}$

ultracentrifuge

a centrifuge optimized for spinning a rotor at very high speeds

uniform circular motion

the motion of an object in a circular path at constant speed