

# CIE A-Level Physics

## 7 - Motion in a Circle

### Flashcards

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# What are radians the unit of?



What are radians the unit of?

Angle.



# How do you convert degrees to radians?



How do you convert degrees to radians?

To convert an angle from degrees to radians, divide it by 360 and then multiply by  $2\pi$ .



What is meant by the period of an object in circular motion?



What is meant by the period of an object in circular motion?

The time taken for one full rotation.



# What is meant by angular velocity?





## What is meant by angular velocity?

The angle travelled through divided by the time taken.

This is similar to linear speed, except we're interested in the rate of rotation rather than distance/time.



What kind of force is required to keep an object moving in a circle at constant speed?



What kind of force is required to keep an object moving in a circle at constant speed?

A constant centripetal force - a force that always acts towards the centre of the circular path.



True or false? The centripetal force and velocity of an object moving in a circle are always in the same direction.



True or false? The centripetal force and velocity of an object moving in a circle are always in the same direction.

False.

Velocity is always at a tangent to the circle, force is always along a radius. They are perpendicular.



# How are linear and angular velocity related?



How are linear and angular velocity related?

$$v = \omega r$$

Where  $v$  = linear velocity,  $\omega$  = angular velocity, and  $r$  = radius



An object moving in a circle at a constant speed is not accelerating. True or False?





An object moving in a circle at a constant speed is not accelerating. True or False?

False.

The direction is always changing hence the velocity is always changing which means it is accelerating.



What equation gives acceleration in terms of angular velocity?



What equation gives acceleration in terms of angular velocity?

$$a = \omega^2 r$$



What is acceleration in terms of linear velocity?



What is acceleration in terms of linear velocity?

$$a = v^2 / r$$



What are the equations for centripetal force?



What are the equations for centripetal force?

$$F = mv^2/r$$

Or

$$F = m\omega^2r$$

