



# A2 Level Physics

Chapter 8 – Further Mechanics

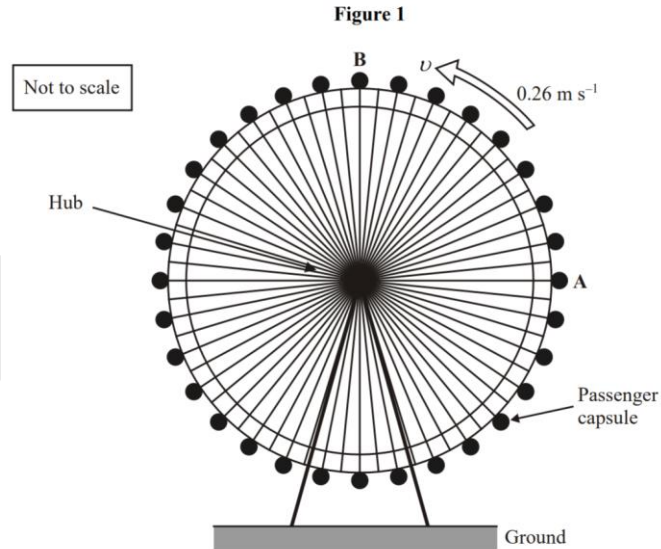
8.1.2 Kinematics of Circular Motion

Worked Examples

## Kinematics of Circular Motion

### Exam Style Question 1

The London Eye is a tourist attraction designed to give passengers a panoramic view over London. The giant wheel completes two revolutions in one hour. Each capsule moves with a constant speed of  $0.26 \text{ m s}^{-1}$  as it follows a circular path.



Calculate the radius of this circular path.



## Kinematics of Circular Motion

### Exam Style Question 1

Calculate the radius of this circular path.

Use  $v = \frac{2\pi r}{T}$  and rearrange for  $r$ :

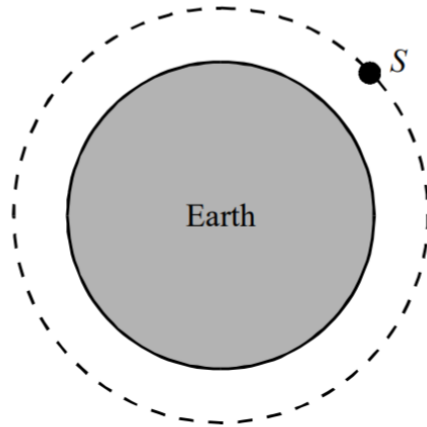
But  $T = \frac{3600}{2} = 1800 \text{ s}$  because the London eye completes two revolutions in one hour therefore it can complete one revolution in 30 minutes (or 1800 seconds).

$$r = \frac{vT}{2\pi} = \frac{(0.26 \text{ m s}^{-1})(1800 \text{ s})}{2\pi} = 74.48 \text{ m}$$

## Kinematics of Circular Motion

### Exam Style Question 2

A satellite  $S$  orbits the Earth once every  $87 \text{ minutes}$ . Show that its angular speed is approximately  $1 \times 10^{-3}$  radians per second.



## Kinematics of Circular Motion

### Exam Style Question 2

Show that its angular speed is approximately  $1 \times 10^{-3}$  radians per second.

Use  $\omega = \frac{2\pi}{T}$

$$\omega = \frac{2\pi}{(87 \text{ minutes} \times 60)} = 1.2 \times 10^{-3} \text{ rads/s}$$



Please see '**8.1.1 Kinematics of Circular Motion notes**' pack for revision notes.

For more revision notes, tutorials and worked examples please visit [www.tutorpacks.co.uk](http://www.tutorpacks.co.uk).

