A2 Level Physics

Chapter 13 – Circular Motion

13.1.2 Kinematics of Circular Motion

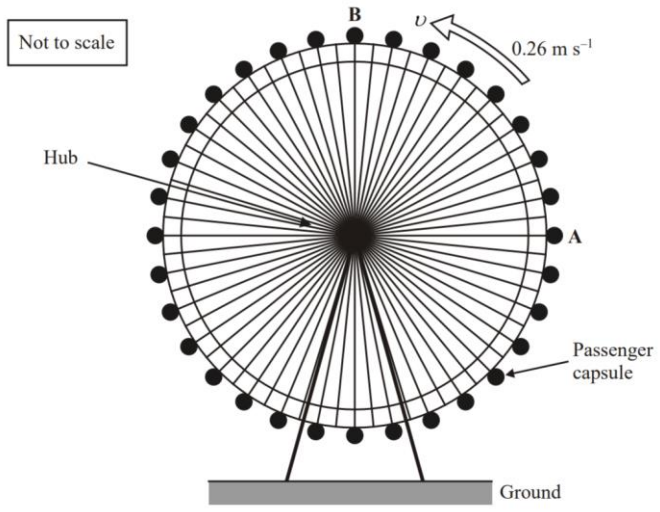
Worked Examples

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 $0.26\ m\ s^{-1}$ as it follows a circular path.

Figure 1



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

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

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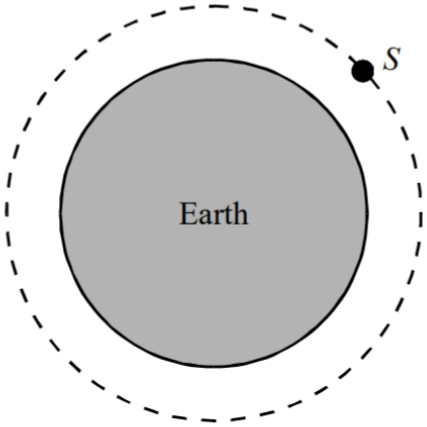
Kinematics of Circular Motion

Exam Style Question 2

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



Kinematics of Circular Motion

Exam Style Question 2

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

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

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

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Please see '13.1.1 Kinematics of Circular Motion notes' pack for revision notes.

For more revision notes, tutorials and worked examples please visit www.tutorpacks.co.uk.

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