

Earth & The Solar System

Question Paper

Course	CIE IGCSE Physics
Section	6. Space Physics
Topic	Earth & The Solar System
Difficulty	Medium

Time Allowed	70
Score	/56
Percentage	/100

Question 1a**Extended tier only**

The Sun lies at the centre of our solar system, with all other bodies, such as planets, orbiting it, as shown in Fig. 1.1.

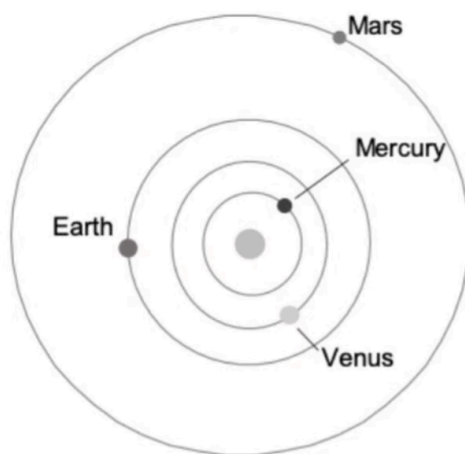


Fig. 1.1

State **two** similarities and **one** difference between the orbits of the planets.

[3 marks]

Question 1b

The innermost planets of the solar system are rocky compared to the outer planets.

- (i) State the source of the heavier elements making up the inner planets. [1]
 - (ii) State the name of the process which led to the formation of the inner planets and explain their formation. [5]
- [6 marks]

Question 1c

Explain the difference between the inner planets of the solar system and the outer planets.

[4 marks]

Question 2a

Extended tier only

The graph in Fig. 2.1 gives data for four bodies in the outer solar system.

Uranus orbits the Sun at an average distance of 2900 million km.

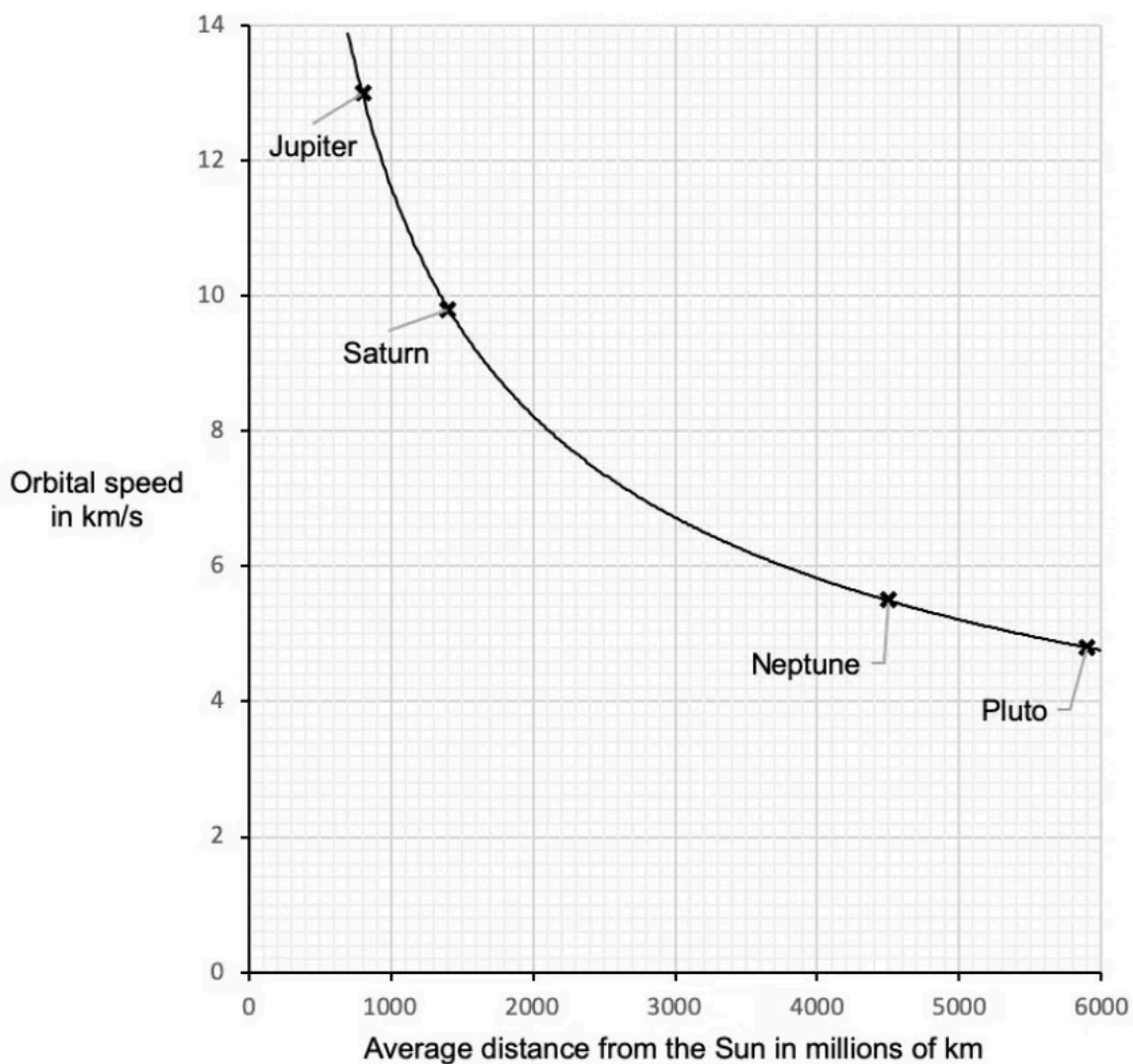


Fig. 2.1

Use the graph to determine the orbital speed of Uranus.

[2 marks]

Question 2b

Extended tier only

Use data from the graph to calculate

- (i) The distance travelled by Jupiter in one orbit.

distance = million km [3]

- (ii) The time taken for Jupiter to complete one orbit, giving your answer in days.

orbital period = days [3]

[6 marks]

Question 2c**Extended tier only**

Fig. 2.2 shows the typical orbit of a planet.

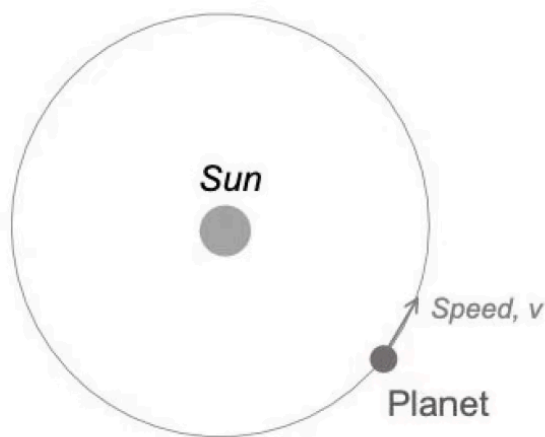


Fig. 2.2

Add a line to the diagram to show the typical orbit of a comet.

[1 mark]

Question 2d**Extended tier only**

Add an **X** to the line drawn in part (c) indicating the point at which the comet will be travelling with the greatest speed.

[1 mark]

Question 3a

Fig. 1 shows a diagram of the solar system.

For each position (i – iii) state the name of the body indicated.

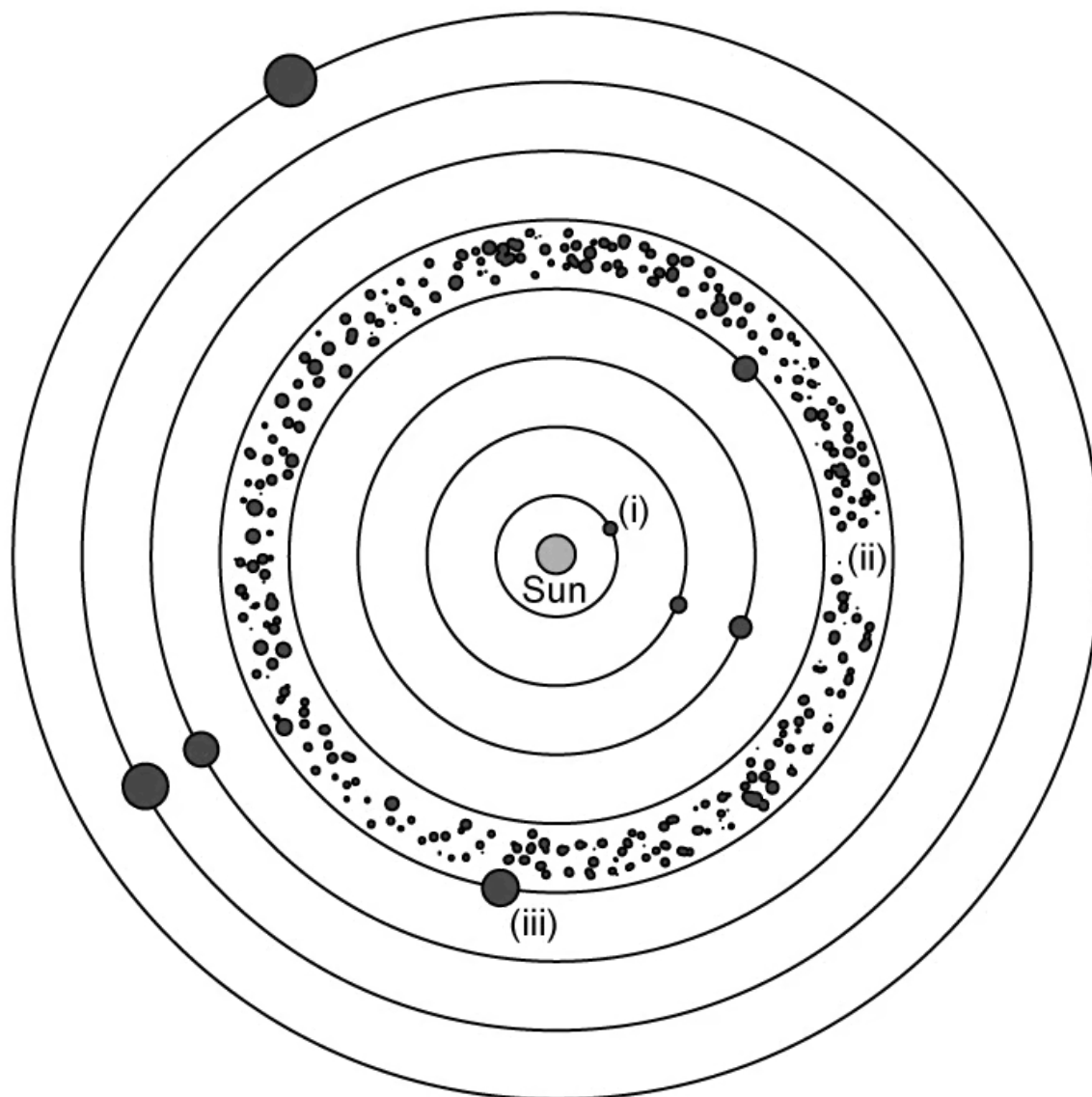


Fig. 1 (not to scale)

[3 marks]**Question 3b**

There are more than 200 moons in our solar system.

- (i) State the meaning of the term 'moon'. [1]
- (ii) Choosing from the labelled bodies in part (a), state the body or bodies which have moons. [1]
- (iii) Earth has one moon, known as the Moon. Name one other planet in the solar system apart from the answer to part (ii) which has a moon. [1]

[3 marks]

Question 3c**Extended tier only**

Astronomers launched the Hubble telescope in 1990, placing it in orbit around the Earth.

The table in Fig. 2 shows information about the orbits around the Earth of both the Hubble Telescope and the Moon.

	average radius of orbit / km	orbital period
Hubble telescope	550	96 minutes
Moon	385 000	28 days

Fig. 2

For the Hubble telescope and the Moon:

- (i) Calculate the closest distance between the Moon and the Hubble telescope.
- (ii) Explain why the distance between the Moon and the Hubble telescope changes.

[1]

[2]

[3 marks]

Question 3d**Extended tier only**

Using the data in the table in part (c) calculate the orbital speed of the Hubble telescope.

The radius of the Earth is 6400 km.

[5 marks]

Question 4a

Fig. 1 shows a diagram of the solar system.

For each position (i – iii) state the name of the body indicated.

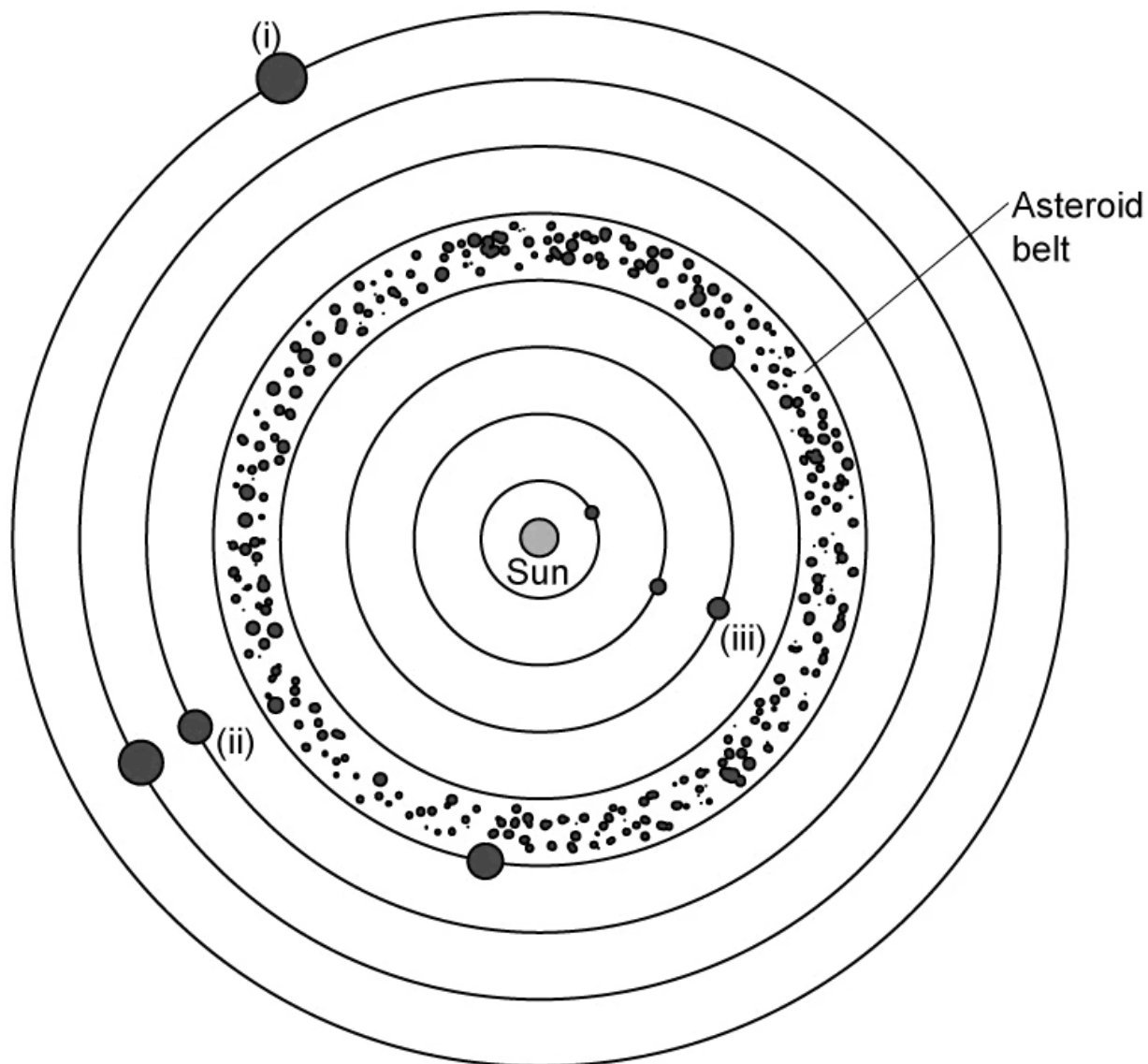


Fig. 1 (not to scale)

[3 marks]

Question 4b

The asteroid belt can be considered as the dividing line between the inner and outer planets.

Compare the differences between these two groups of planets.

[3 marks]

Question 4c

Extended tier only

Fig. 2 is a graph showing the relationship between orbital speed in km/s and mean distance from the Sun measured in astronomical units, AU.

The positions of Saturn and Pluto have been plotted and labelled.

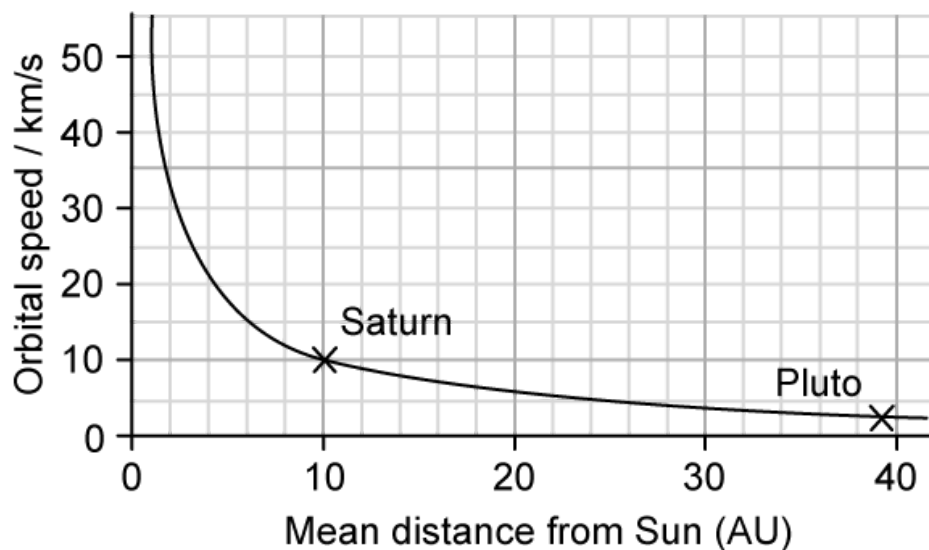


Fig. 2

For the planet Uranus

- Indicate on the graph where Uranus is most likely to be plotted
- Use your plotted point to estimate the orbital speed of Uranus

[3]

[1]

[4 marks]

Question 5a

Fig. 1 shows a diagram of the solar system.

- (i) Add to the diagram to show the location of the asteroid belt. [2]
- (ii) Sketch a possible orbit of a comet entering and leaving the solar system. [2]

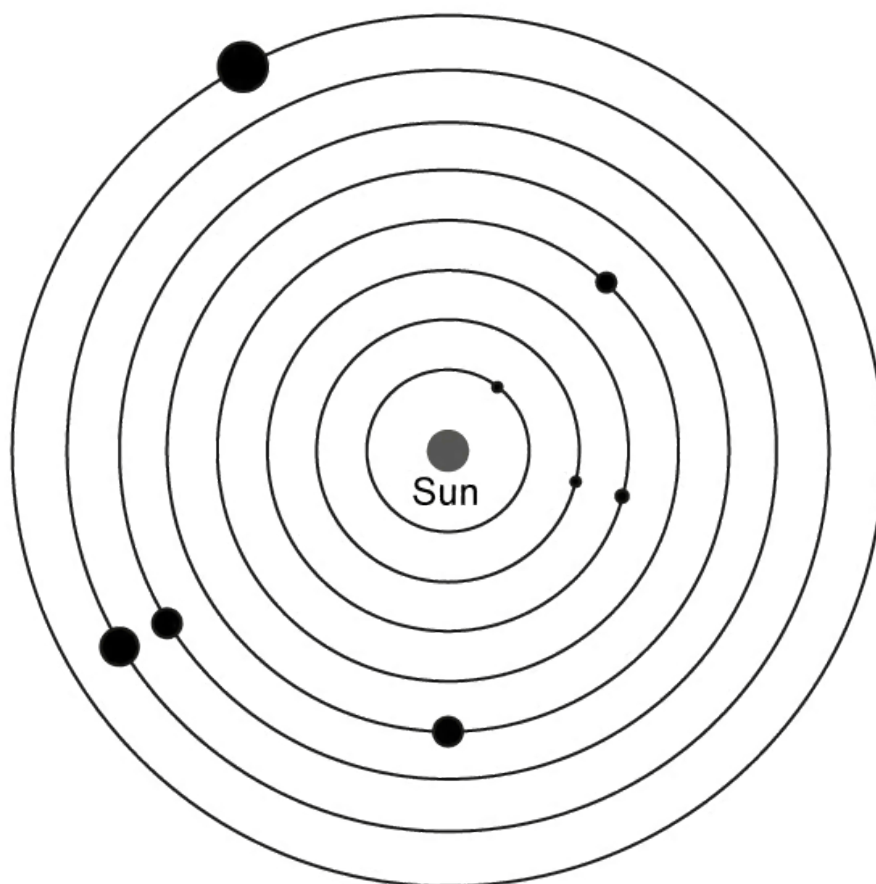


Fig. 1 (not to scale)

[4 marks]

Question 5b

Extended tier only

Compare the orbits of comets and planets.

[5 marks]