

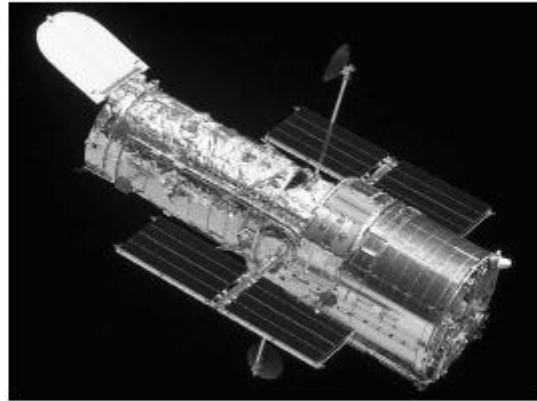
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Astronomy

Problems by Topic

Edexcel International GCSE

- 9 The Hubble Space Telescope is in orbit around the Earth.
It detects visible light from distant objects.



(a) Name the force that keeps the telescope in orbit around the Earth.

(1)

(b) The Hubble Space Telescope moves in a circular orbit.

Its distance above the Earth's surface is 560 km.

(i) The radius of the Earth is 6400 km.

Calculate the radius of the orbit of the Hubble Space Telescope.

(1)

Radius = km

(ii) The Hubble Space Telescope completes one orbit in 96 minutes.

Calculate its orbital speed in m/s.

(3)

Orbital speed = m/s

(c) The Chandra Telescope also orbits the Earth, but does not move in a circular orbit.

Its distance from the Earth and its speed change as it orbits the Earth.

It travels fastest when it is closest to the Earth.

Use ideas about energy to explain why.

(3)

(d) The Chandra Telescope detects X-rays from distant objects.

(i) State the name of the type of wave that includes X-rays and visible light.

(1)

(ii) Describe **two** differences between X-rays and visible light.

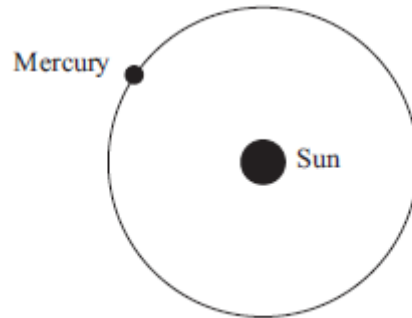
(2)

1

2

January 2012

4 The planet Mercury orbits the Sun.



(a) Mercury takes 88 days to orbit the Sun.

The average radius of the orbit is 58 million km.

Calculate the average orbital speed of Mercury.

Give the unit.

(3)

Average orbital speed = Unit

(b) Comets also orbit the Sun.

(i) Name the force that causes comets and planets to orbit the Sun.

(1)

(ii) Add to the diagram opposite to show the orbit of a typical comet. (1)

(iii) The speed of a comet changes during its orbit.

On the orbit you have drawn, label with the letter X the position where the comet travels at its **fastest** speed.

(1)

(iv) Explain why the comet travels fastest at point X.

(2)

(Total for Question 4 = 8 marks)

January 2013

10

(b) The Astra satellite takes 24 hours to orbit the Earth once.

It travels at a speed of 3.1 km/s.

Calculate the orbital radius of the satellite and give the unit.

(4)

orbital radius = unit

(c) The Astra satellite orbits above the equator and travels in the same direction as the rotation of the Earth.

Suggest why this type of 24-hour orbit is an advantage for communications.

(1)

.....

.....

.....

(Total for Question 10 = 8 marks)

January 2015

2 (a) These sentences are about astronomy.

Complete the sentences by writing words in the blank spaces.

(4)

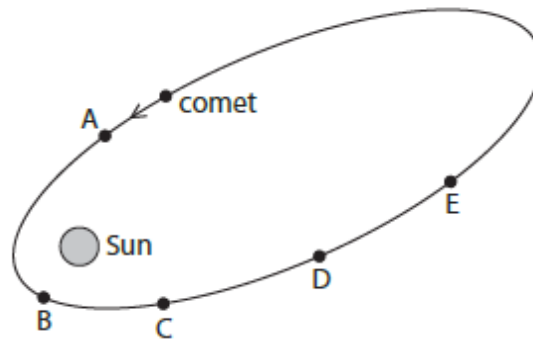
The Earth is an astronomical object.

One astronomical object smaller than the Earth is

Two astronomical objects larger than the Earth are and

The Milky Way is the name given to our.....

(b) The diagram shows the path followed by a comet as it moves around the Sun. A, B, C, D and E are points on the comet's orbit.



(i) State the name of the force that causes the comet to orbit the Sun.

(1)

(ii) At which of the points shown is the force on the comet greatest?

(1)

(iii) Draw an arrow at point D to show the direction of the force acting on the comet.

(1)

(iv) At which of the points shown does the comet have the greatest kinetic energy?

(1)

(Total for Question 2 = 8 marks)

January 2016