



KS3 Science

Space

Question Paper

Time available: 34 minutes

Marks available: 51 marks

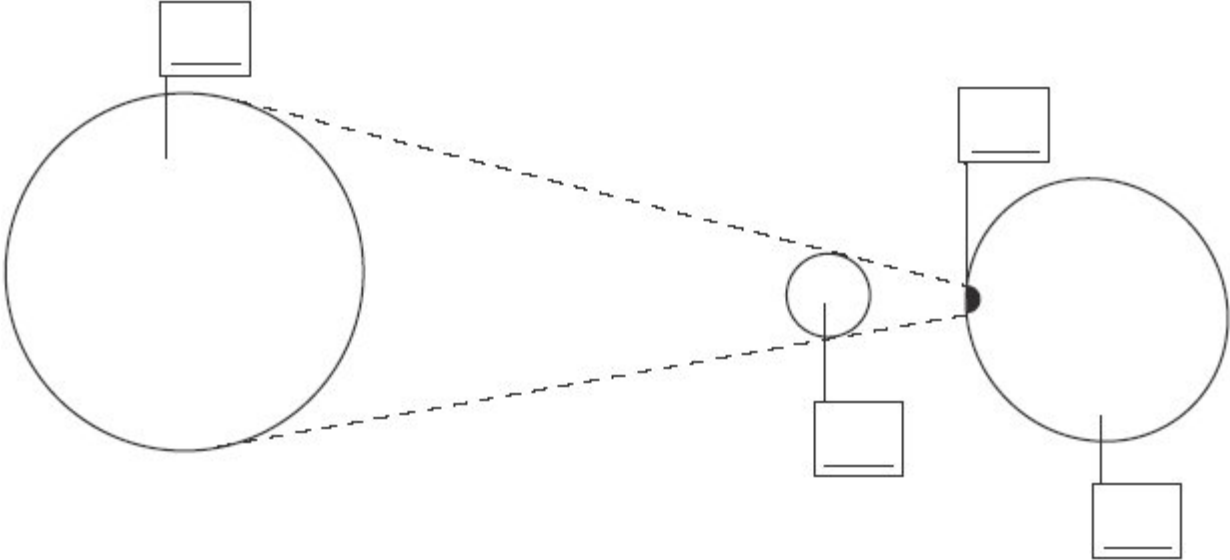
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1.

(a) The diagram below shows the positions of the Sun, Moon and Earth during a solar eclipse.

Write numbers (1–4) on the diagram below to label the features during an eclipse.

- 1. the Earth
- 2. the Moon
- 3. the Sun
- 4. a region where the total eclipse of the Sun is taking place



not to scale

2 marks

(b) Scientists discovered a regular cycle of eclipses. It is called the Saros cycle. The table below shows the dates of some eclipses in this cycle.

Complete the table by predicting the date of the next eclipse in the Saros cycle.

eclipse	date
eclipse 1	20th July 1963
eclipse 2	31st July 1981
eclipse 3	11th August 1999
eclipse 4	

2 marks
maximum 4 marks

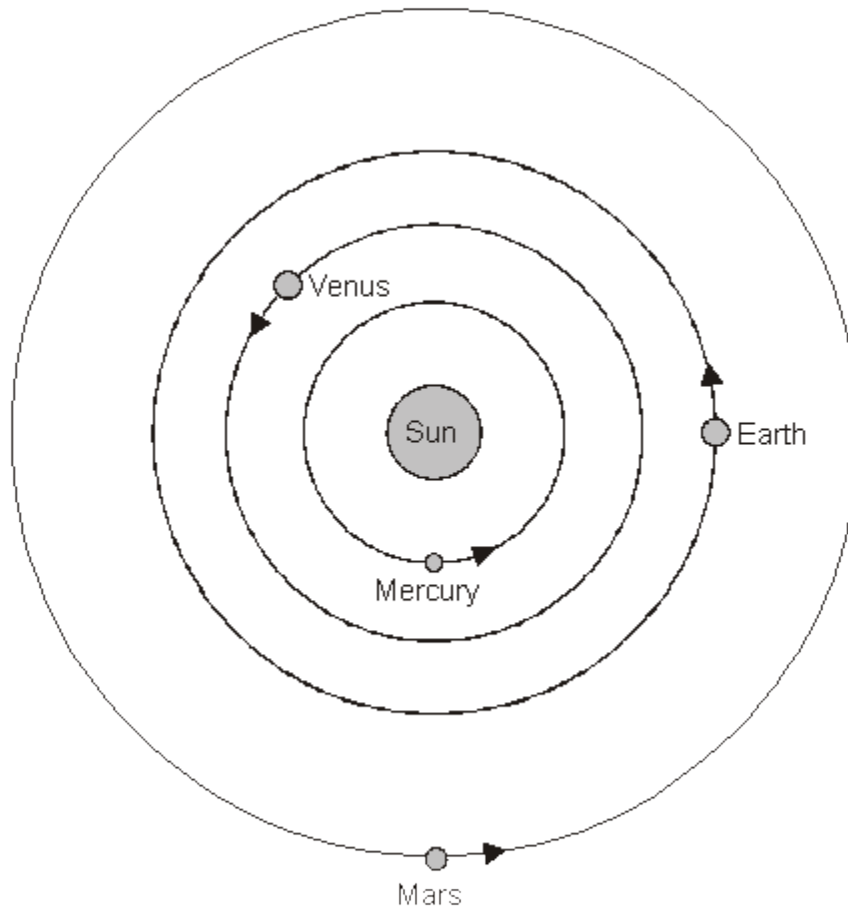
2.

The table below shows information about four planets.

planet	time taken to orbit the Sun (Earth years)	distance from the Sun (million km)
Mercury	0.25	60
Venus	0.5	108
Earth	1.0	150
Mars	2.0	228

The diagram below shows the orbits of the Earth, Mercury, Venus and Mars, and their position at one particular time.

The arrows show the direction in which the planets move.



not to scale

- (a) Show the position of each planet six months later by drawing a letter X on the orbit of each planet.

2 marks

(b) Use the information in the table to calculate the largest and smallest distance between the Earth and Venus.

closest million km

1 mark

furthest million km

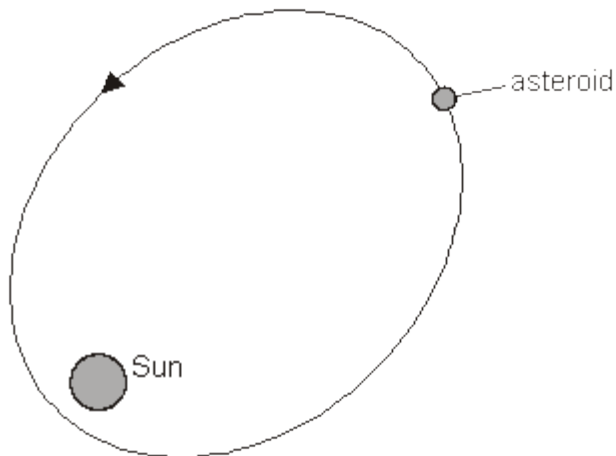
1 mark

(c) The speed of light is 300 000 km/second.
Calculate how long light takes to reach the Earth from the Sun.

.....
..... S

1 mark

(d) The diagram below shows the path of an asteroid around the Sun.



not to scale

(i) **On the path of the asteroid**, draw a letter S to show the position where the asteroid is travelling the slowest.

On the path of the asteroid, draw a letter F to show the position where the asteroid is travelling the fastest.

1 mark

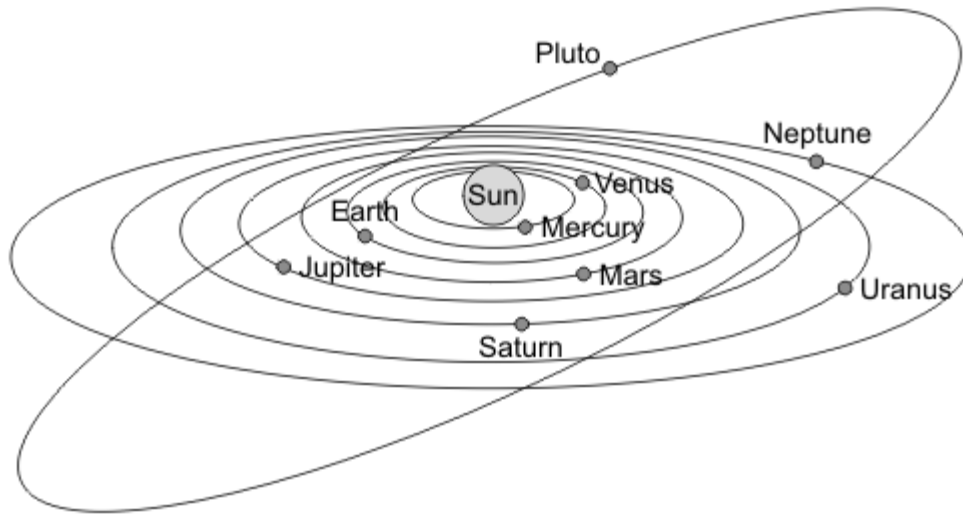
(ii) Explain why the speed of the asteroid changes.

.....
.....

1 mark
maximum 7 marks

3. Pluto was discovered in 1930. It was classified as a planet. In 2006, scientists agreed that Pluto is **not** a planet.

(a) The diagram below shows our solar system.



not to scale

(i) **From the diagram**, what supports the idea that Pluto is a planet?

.....

1 mark

(ii) **From the diagram**, what supports the idea that Pluto is **not** a planet?

.....

1 mark

(b) The table below shows information about planets in our solar system.

planet	diameter (km)
Mercury	4800
Venus	12200
Earth	12800
Mars	6800
Jupiter	142600
Saturn	120200
Uranus	49000
Neptune	50000

Pluto has a diameter of 2 300 km.

How does this information suggest to scientists that Pluto is **not** a planet?

.....

1 mark

(c) An object called Charon orbits Pluto.

How does the presence of Charon support the idea that Pluto is a planet?

.....

1 mark

- (d) The table below shows the composition of the atmosphere of some of the objects in our solar system.

object	atmosphere
Mercury	none
Venus	mainly carbon dioxide
Earth	mainly nitrogen and oxygen
Neptune	hydrogen, helium and methane
Earth's moon	none
Titan (a moon)	nitrogen and methane
Pluto	nitrogen and methane

Atmosphere is **not** used to classify objects as moons or planets. Use the information above to suggest a reason for this.

.....

1 mark

- (e) Why do you think scientists found it difficult to decide how Pluto should be classified?

.....

1 mark
 maximum 6 marks

4.

The table shows information about three planets in our solar system.

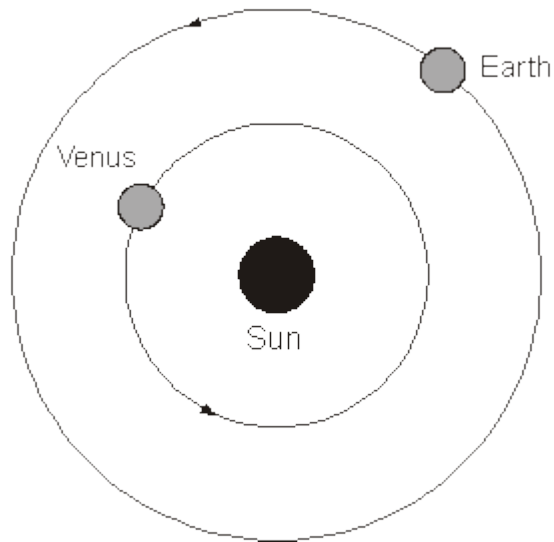
planet	time taken to orbit the Sun (Earth-years)
Mars	2.0
Venus	0.6
Earth	1.0

- (a) Give **one** reason why Venus takes less time than Earth to orbit the Sun.

.....

1 mark

- (b) The diagram below shows the orbits of Venus and Earth. The Sun is a source of light. Venus does **not** produce its own light.



not to scale

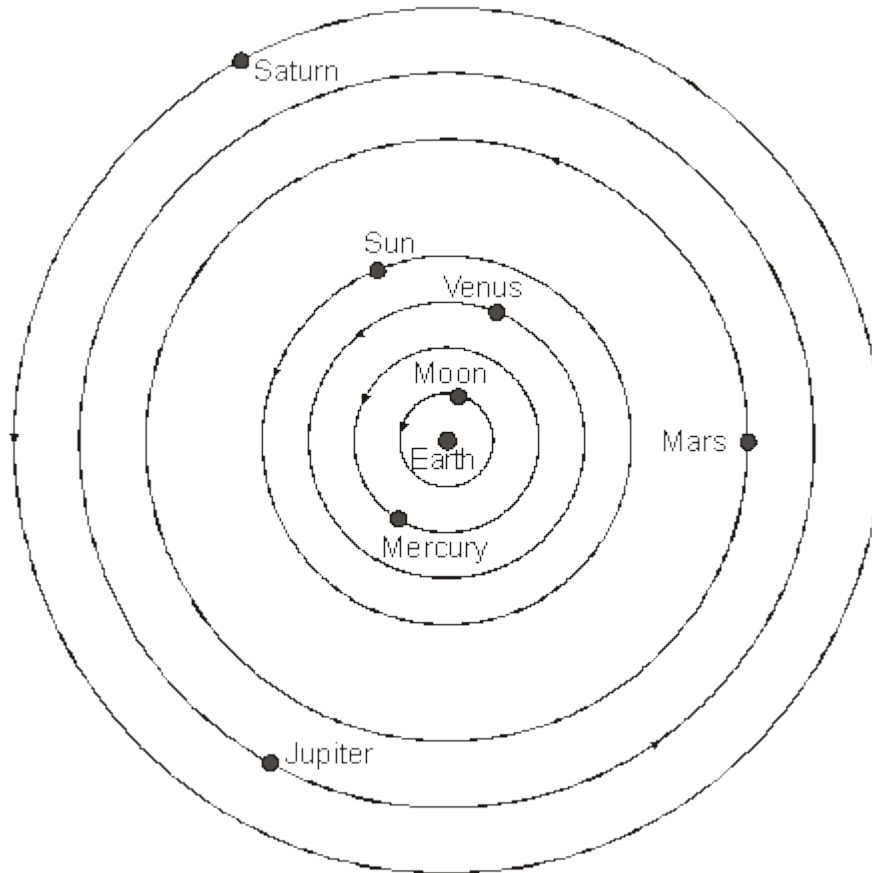
On the diagram above, draw rays of light to show how Venus can be seen from Earth. Use a ruler.

1 mark

Draw an arrow **on each** ray to show the direction of light.

1 mark

- (c) The diagram below shows how the astronomer Ptolemy drew the solar system 2000 years ago.



not to scale

- (i) The planets Uranus and Neptune are missing from his diagram.

Suggest why Ptolemy did **not** include these planets in his diagram.

.....

1 mark

- (ii) Today we know the correct arrangement of the planets in our solar system.

Give **one** way the diagram above is incorrect.
 Complete the sentence below.

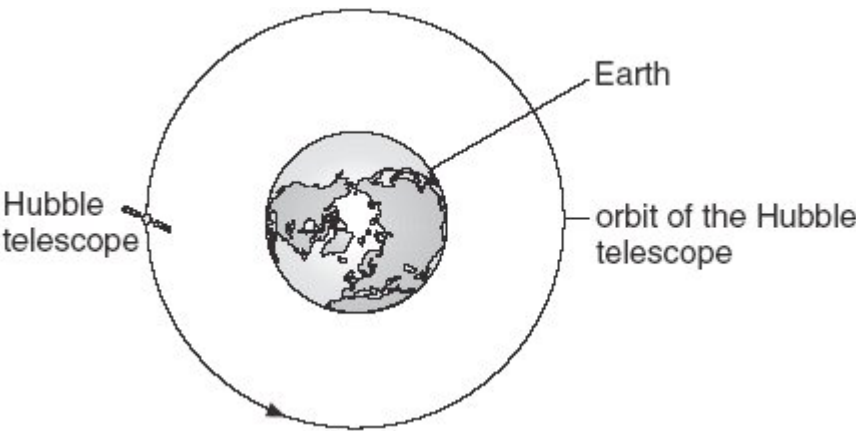
In the correct arrangement

.....

1 mark
 maximum 5 marks

5.

The diagram below shows the Hubble telescope in orbit around the Earth.



not to scale

(a) Which force keeps the telescope in orbit around the Earth?
 Tick the correct box.

air resistance	<input type="checkbox"/>	friction	<input type="checkbox"/>
gravity	<input type="checkbox"/>	magnetism	<input type="checkbox"/>

1 mark

(b) The Hubble telescope is a satellite used for looking at planets and stars.

Give **one** other use of satellites.

.....

1 mark

(c) Fill each of the gaps in the following sentences with a different word from the box below.

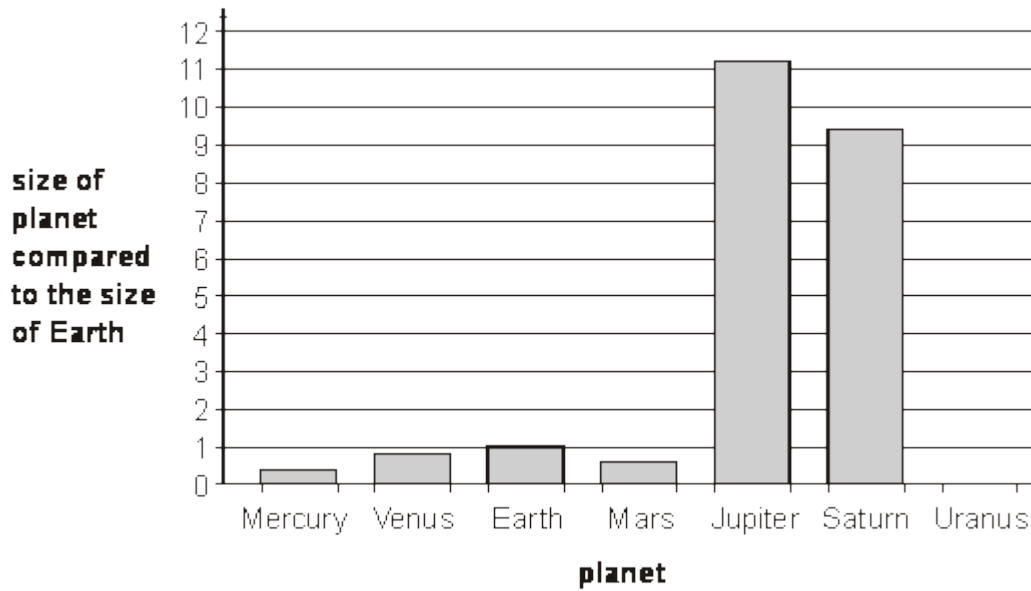
absorbs	produces	reflects
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You can see the Sun because it light.

You can see a satellite because it light.

1 mark

(d) The bar chart shows the size of five planets compared to the size of Earth.



The planet Uranus is four times the size of Earth.
On the chart above, draw a bar for the planet Uranus.

1 mark

(e) (i) Arrange the following in order of size, starting with the smallest.

Sun	Hubble telescope	Earth
------------	-------------------------	--------------

.....
smallest **largest**

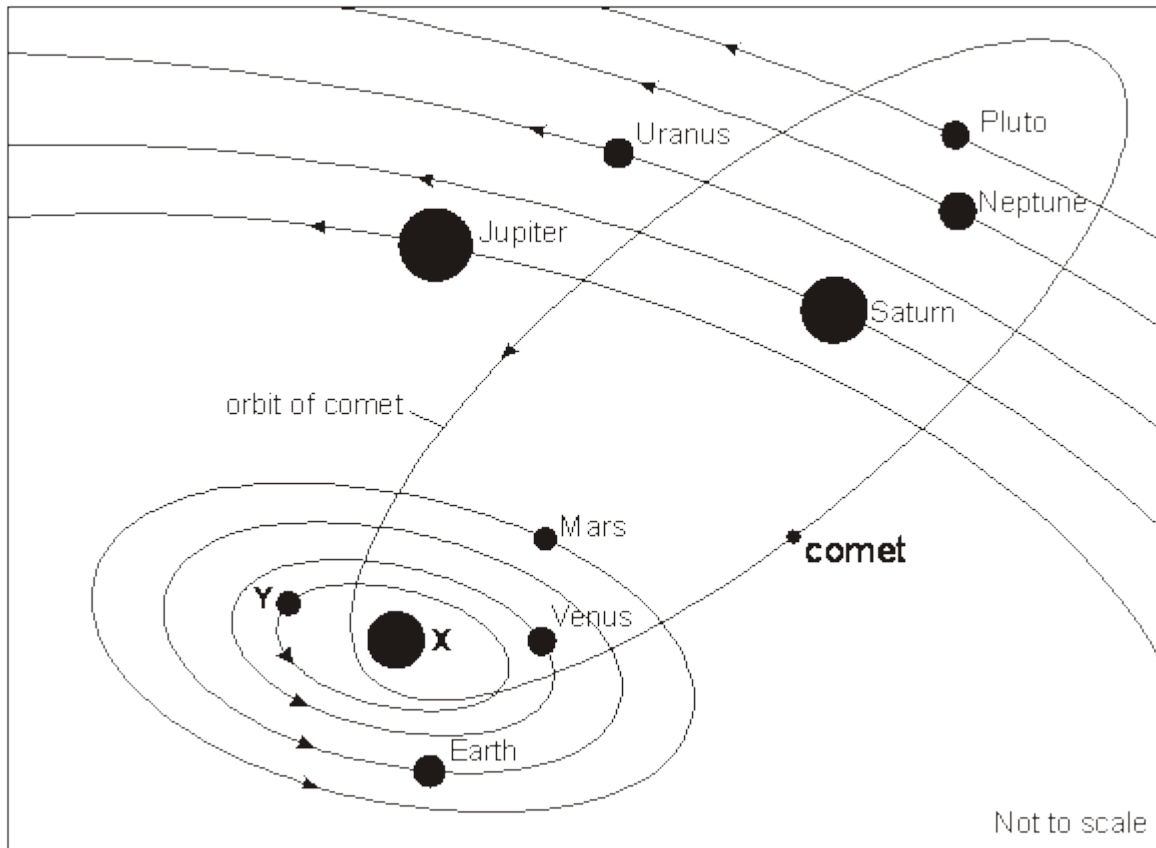
1 mark

(ii) Some stars are bigger than the Sun but they look smaller.
 Why do they look smaller than the Sun?
 Tick the correct box.

They are brighter than the Sun.	<input type="checkbox"/>	They are the same colour as the Sun.	<input type="checkbox"/>
They are further away than the Sun.	<input type="checkbox"/>	They are nearer than the Sun.	<input type="checkbox"/>

1 mark
 maximum 6 marks

6. (a) The diagram below shows part of the solar system.



Look at the diagram.
Give the names of X and Y.

X.....

Y.....

2 marks

(b) It takes Jupiter much longer than Mars to complete one orbit.
Give **two** reasons for this.

1

.....

2

.....

2 marks

(c) The diagram also shows the orbit of a comet.

In 1531, 1607 and 1683 scientists recorded that had seen a comet in the sky.

(i) Edmund Halley looked at these dates and suggested the scientists had all seen the same comet.

Explain how he worked out that it was the same comet each time.

.....
.....

1 mark

(ii) The comet was last seen in 1986.

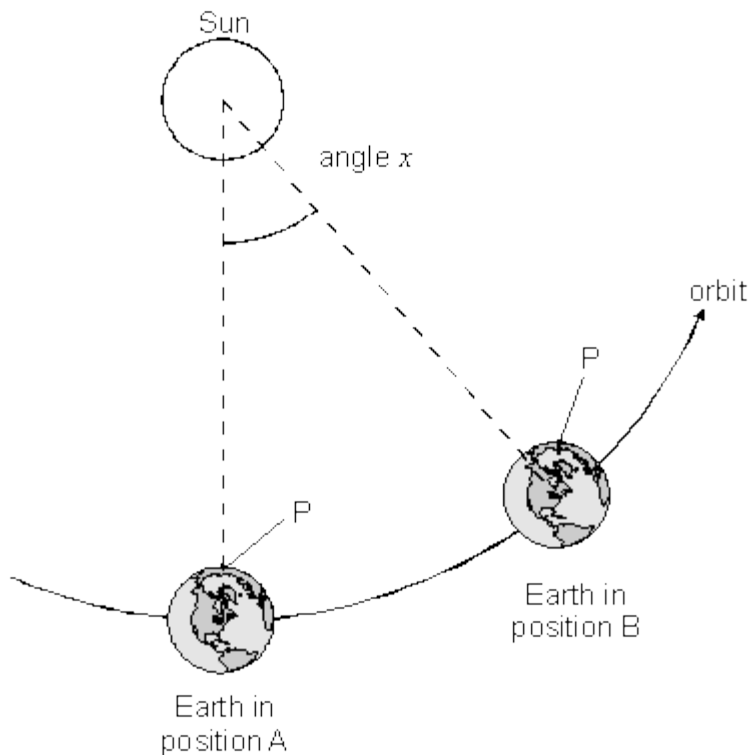
Predict when it will be seen next.

.....

1 mark
maximum 6 marks

7.

The diagram shows the Earth in two positions in its orbit round the Sun, one day apart. The diagram is **not** to scale.



At position A, the Sun is vertically above the point P on the Earth. At position B, the Earth has rotated a full 360° on its axis. It has to rotate a little further before the Sun is again vertically above point P.

- (a) The diagram is **not** drawn to scale, and the angle x has been drawn too large. Through what angle x , to the nearest degree, does the Earth move in its orbit in one day?

.....

1 mark

- (b) For the Sun to be in the same place in the sky (vertically above point P) the Earth has to rotate $(360 + x)^\circ$. This takes exactly 24 hours. How long does it take for the Earth to rotate through 360° ? Give the unit.

.....

1 mark

- (c) One year is approximately 365.25 Earth days. Calculate how many times the Earth actually rotates during one year.

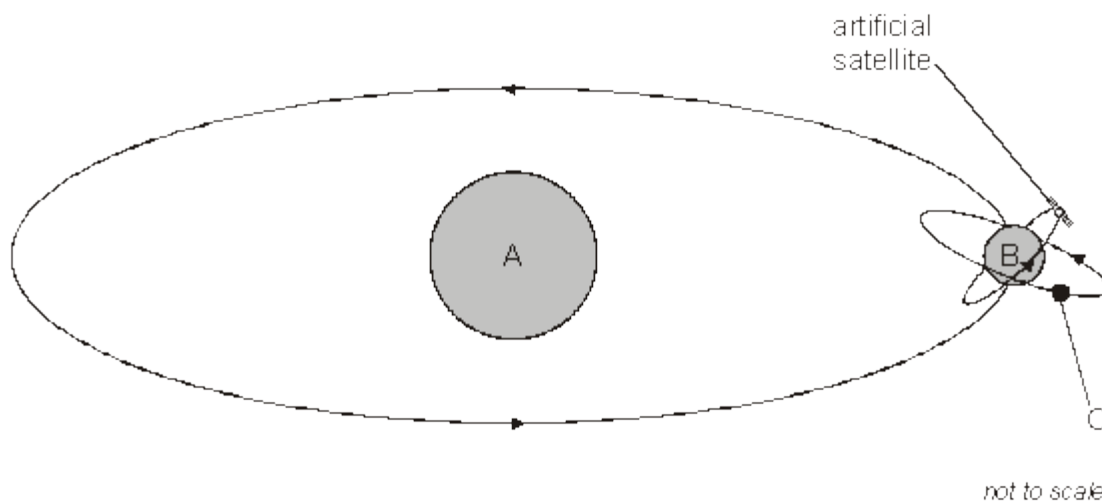
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1 mark

Maximum 3 marks

8.

The diagram below shows the Earth, the Sun, the Moon and an artificial satellite.



- (a) Which letters, on the diagram, show the Earth, the Sun and the Moon?

the Earth

the Sun

the Moon

2 marks

(b) Give **one** use of a satellite.

.....
.....

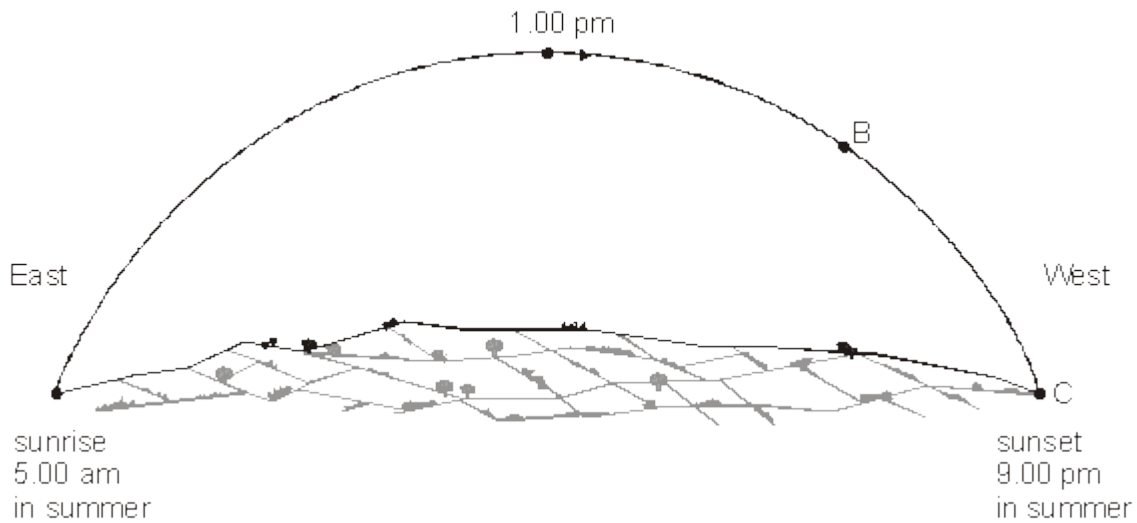
1 mark

(c) Which of the following is a source of light?
Tick the correct box.

the Earth	<input type="checkbox"/>	the Moon	<input type="checkbox"/>
the Sun	<input type="checkbox"/>	a satellite	<input type="checkbox"/>

1 mark

(d) The curve shows the path of the Sun in the sky from sunrise to sunset in England one day in **summer**.



(i) **On the curve**, mark the position of the Sun at 9.00 am.
Label this point A.

1 mark

(ii) The Sun seemed to move from point B to point C.
How many hours did this take?
Tick the correct box.

2 hours	<input type="checkbox"/>	6 hours	<input type="checkbox"/>
4 hours	<input type="checkbox"/>	8 hours	<input type="checkbox"/>

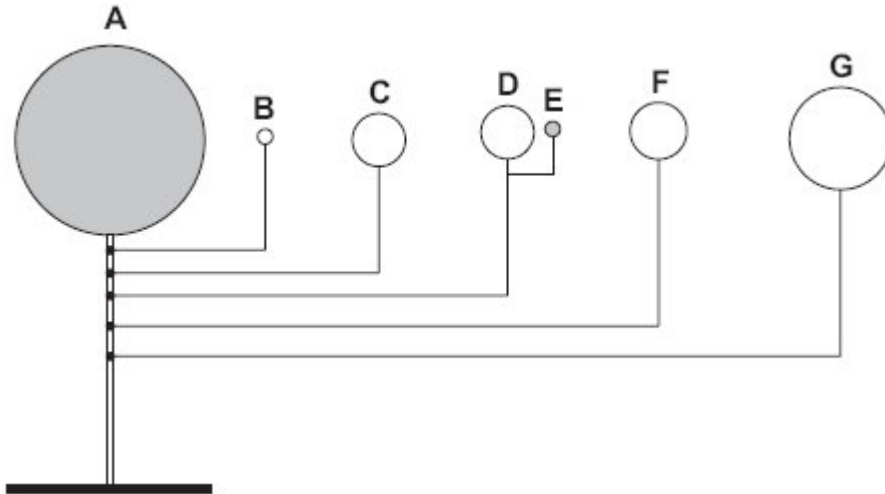
1 mark

- (e) **On the diagram above**, draw the path of the Sun from sunrise to sunset on a day in **winter**.

1 mark
maximum 7 marks

9.

- (a) Alfie made a model of part of the solar system.
He used metal balls for the Sun, the Moon and the planets.



- E goes around D.
- B, C, D, F and G go around A.

Give the letter that is used to label:

- (i) the model Sun;

.....

1 mark

- (ii) the model Earth;

.....

1 mark

- (iii) the model Moon;

.....

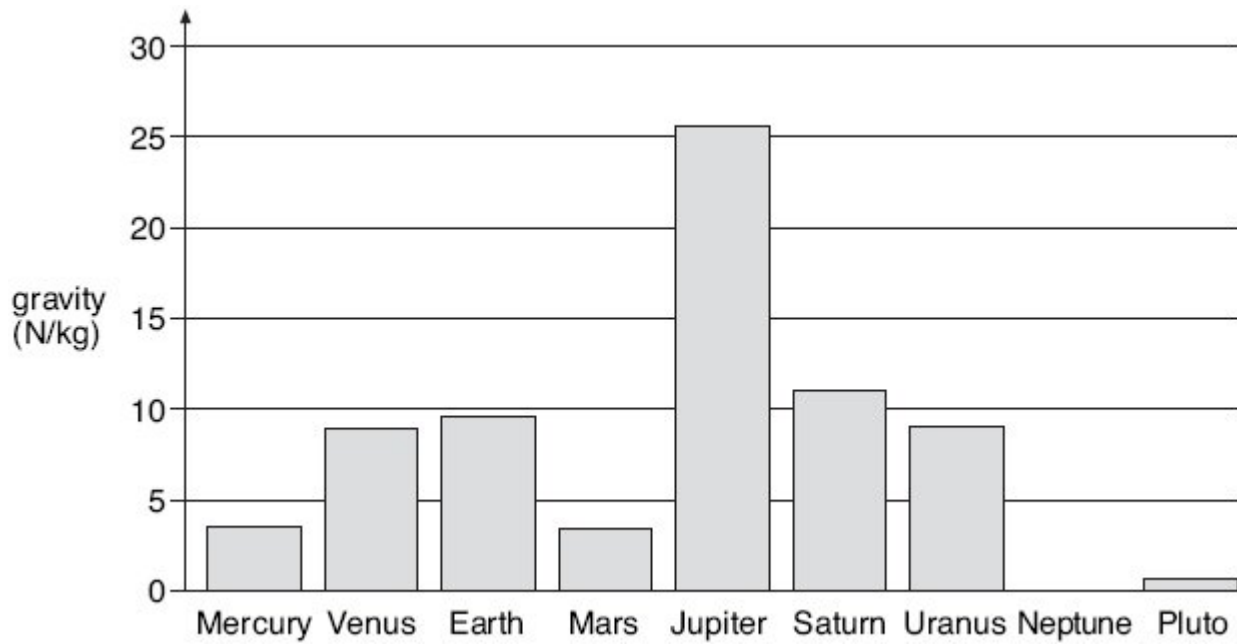
1 mark

- (iv) the model planet with the largest orbit.

.....

1 mark

(b) The bar chart shows the force of gravity on eight of the planets.



(i) The gravity on Neptune is 12 N/kg.

On the chart above, draw a bar for the planet Neptune.
Use a ruler.

1 mark

(ii) Give the name of a planet where you would weigh more than you weigh on Earth.

.....

1 mark

(iii) On which planet would a spaceship need the largest force to take off?

.....

1 mark
maximum 7 marks