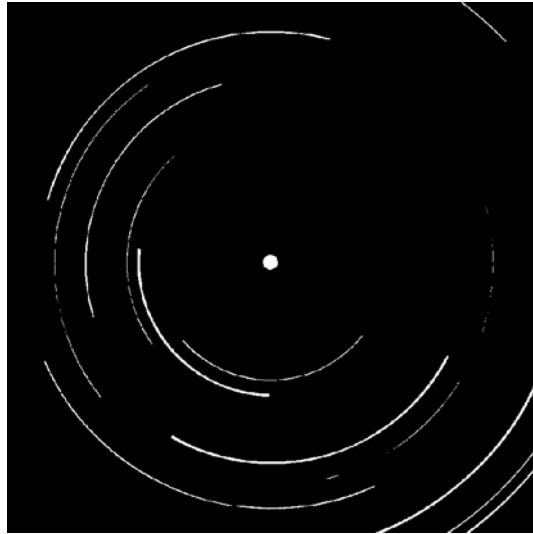


Level 7 questions

1. On a clear night, a camera was set up on a fixed stand pointing at the Pole Star. The camera shutter was opened and kept open for a number of hours. The diagram shows the paths of a number of stars appearing in the photograph.



- (a) (i) In the photograph, most of the stars appear as curved lines instead of dots. Why do the stars appear as curved lines?

.....
.....

1 mark

- (ii) The Pole Star appears as a bright dot in the middle, not as a curved line. Why does the Pole Star appear as a dot?

.....
.....

1 mark

- (b) Study the diagram carefully. For how long was the camera shutter kept open?

..... hours

1 mark

Maximum 3 marks

2. Regulus is a bright star in the constellation Leo. In February, an astronomer visited a country close to the equator. While she was there she observed Regulus.

- (a) During the night, Regulus appeared to move across the sky.

- (i) Why do stars appear to move across the sky?

.....

1 mark

(ii) Choose from the words below to complete the sentence.

north east south west

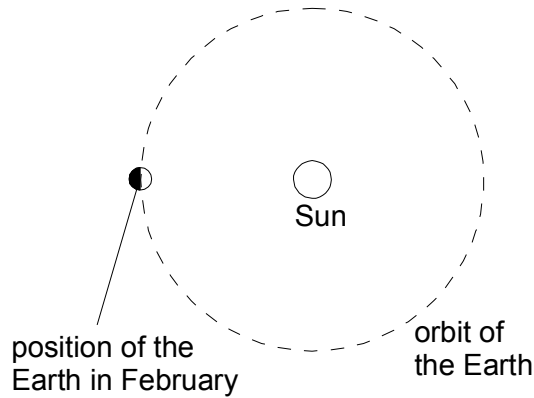
Regulus appeared to move across the sky from

..... to

.....

1 mark

(b) The diagram below shows the position of the Earth and the Sun when the astronomer made her observations. She noticed that Regulus was directly overhead at midnight. On the diagram, draw an arrow from the Earth to show the direction in which she looked to see Regulus.



1 mark

(c) Six months later, in August, Regulus cannot be seen at any time.

Explain why.

.....

.....

1 mark

Maximum 4 marks

3. In 1610, the Italian scientist, Galileo, observed four bright moons near Jupiter. Each night the moons moved.

(a) (i) The Sun and stars are light sources, and the planets are seen by reflected light. Explain how we can see the moons of Jupiter.

.....

.....

.....

.....

2 Marks

- (ii) The four moons are approximately the same distance from the Earth. However, they do **not** have the same brightness. Suggest **one** reason for this.

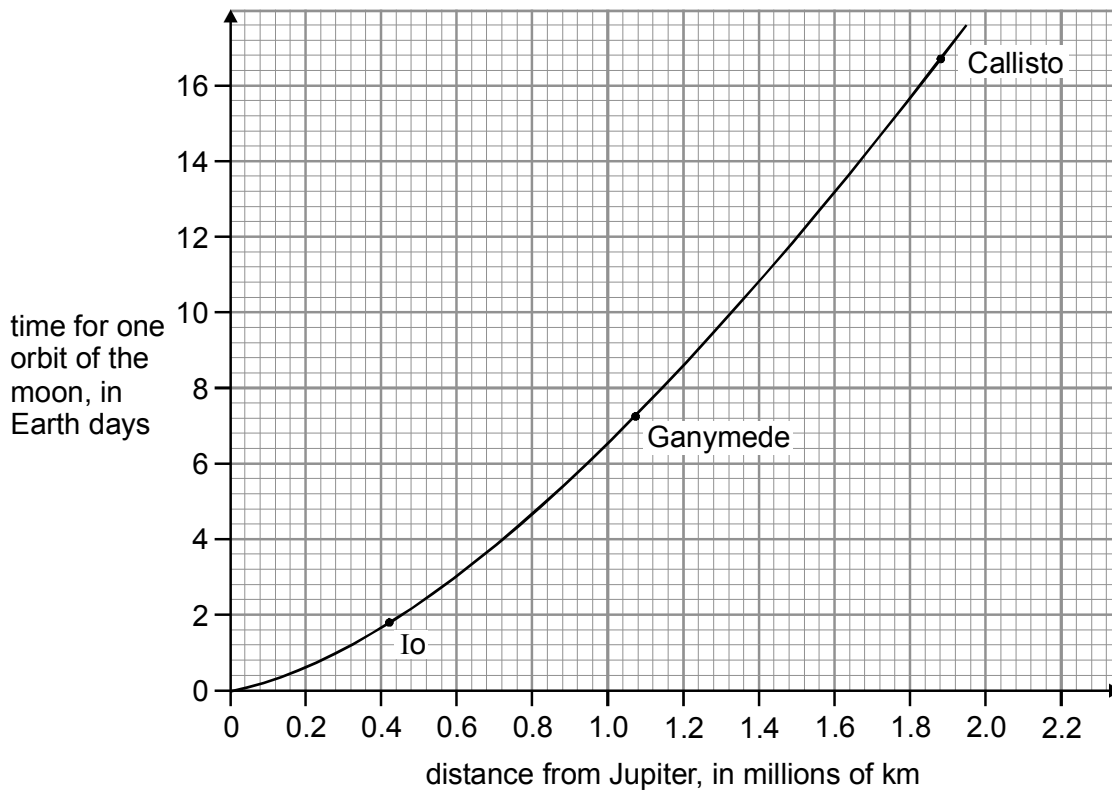
.....

1 mark

- (b) The table shows the distances of the four moons from the centre of Jupiter, and the times of their orbits. Europa's distance has been left out.

name of moon	distance from Jupiter, in millions of km	time for one orbit, in Earth days
Io	0.42	1.8
Europa		3.6
Ganymede	1.07	7.2
Callisto	1.88	16.7

The graph was plotted using the information in the table.



Use the graph to estimate Europa's distance from Jupiter.

.....millions of km

1 mark

(c) Galileo realised that Jupiter and its moons formed a model of our Solar System. In this model:

what did Jupiter represent?

.....

what did the moons represent?

.....

1 mark

Maximum 5 marks