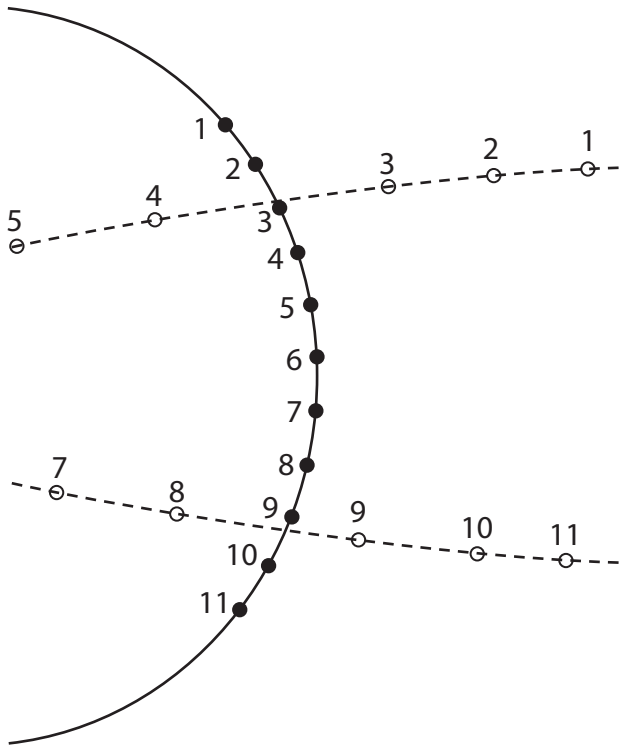
6 A comet passes close to the Earth.

An astronomer observes the position of the comet and the Earth on the same day each week for several weeks.

(a) The diagram shows her observations for weeks 1 to 11.



Path of Earth	———
Path of comet	- - - - - - - - -
Position of Earth week 1	1●
Position of comet week 1	1○

(i) Complete the path for the comet between week 5 and week 7.

(1)

(ii) Mark an X on the diagram to show the position of the Sun.

(1)

(iii) Suggest why the astronomer did not observe the comet during week 6.

(1)

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(iv) The observation showing the comet nearest to the Earth was made during

(1)

- ☒ **A** week 7
- ☒ **B** week 8
- ☒ **C** week 9
- ☒ **D** week 10

(v) Explain how the diagram shows that the speed of the comet changes as it moves from position 1 to position 5.

(2)

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(vi) Suggest why the speed of the comet changes.

(1)

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(b) The Earth orbits the Sun once in 365 days.

The radius of the Earth's orbit is 150 000 000 km.

Calculate the orbital speed of the Earth in kilometres per hour.

(3)

orbital speed = ... kilometres per hour

(Total for Question 6 = 10 marks)