

Astronomy
PAPER 1: Naked-eye Astronomy

Wednesday 12 June 2024 – Morning

Time: 1 hour 45 minutes

Diagram Booklet

THIS DIAGRAM BOOKLET MUST BE RETURNED WITH THE QUESTION PAPER AT THE END OF THE EXAMINATION.

In the boxes below, write your name, centre number and candidate number.

| | | | | | |
|------------------|--|--|--|--|--|
| Surname | | | | | |
| Other names | | | | | |
| Centre Number | | | | | |
| Candidate Number | | | | | |

INSTRUCTIONS

There may be spare copies of some diagrams in case you need them.

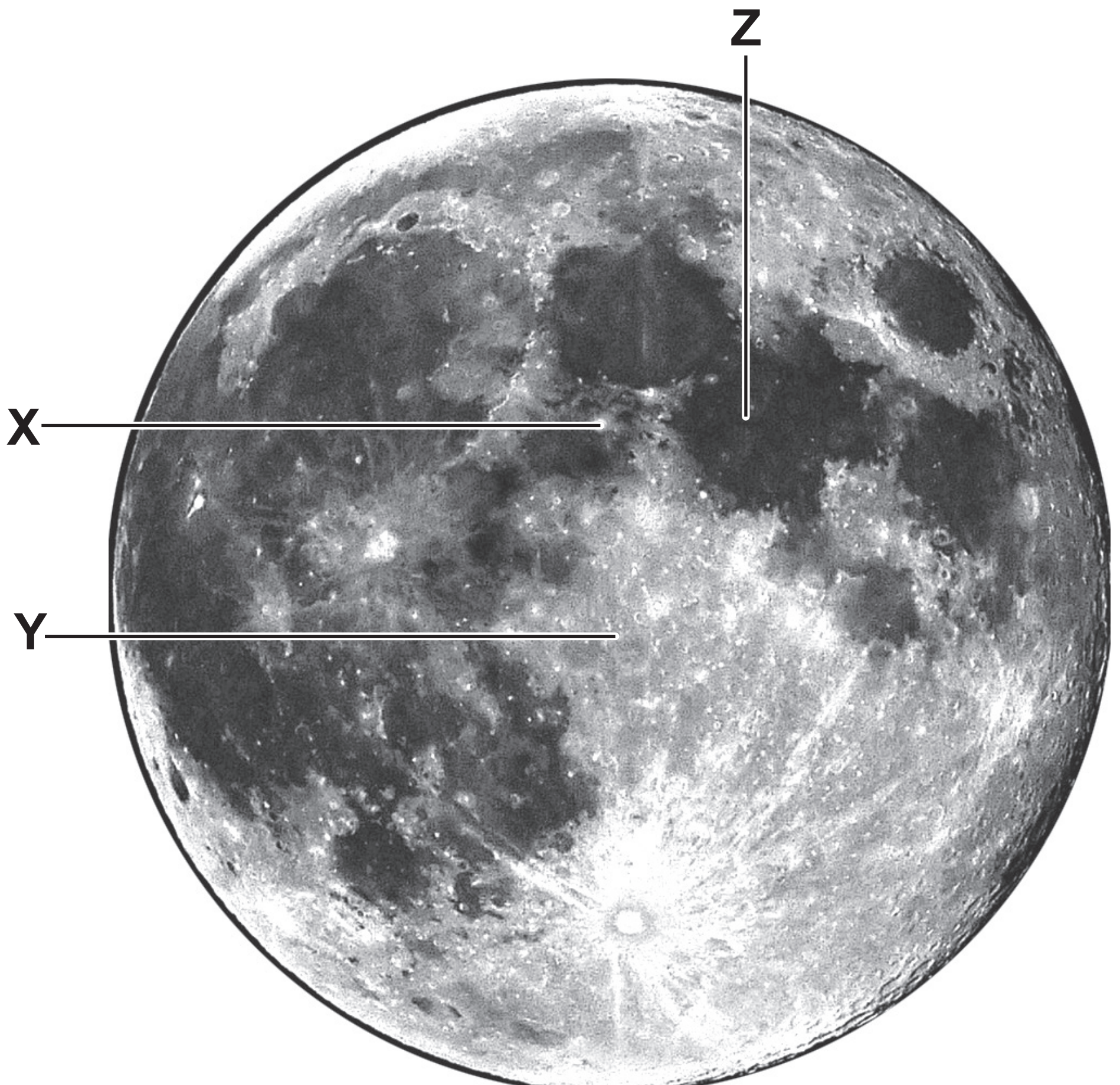
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| 9 | Question 5(b) |
| 10 | Question 6(b) – Blank |
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Spare Copies

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Question 1(a)**FIGURE 1 – image of the full Moon****(continued on the next page)****Turn over**

Question 1(a) continued.

FIGURE 1 – line drawing of the full Moon

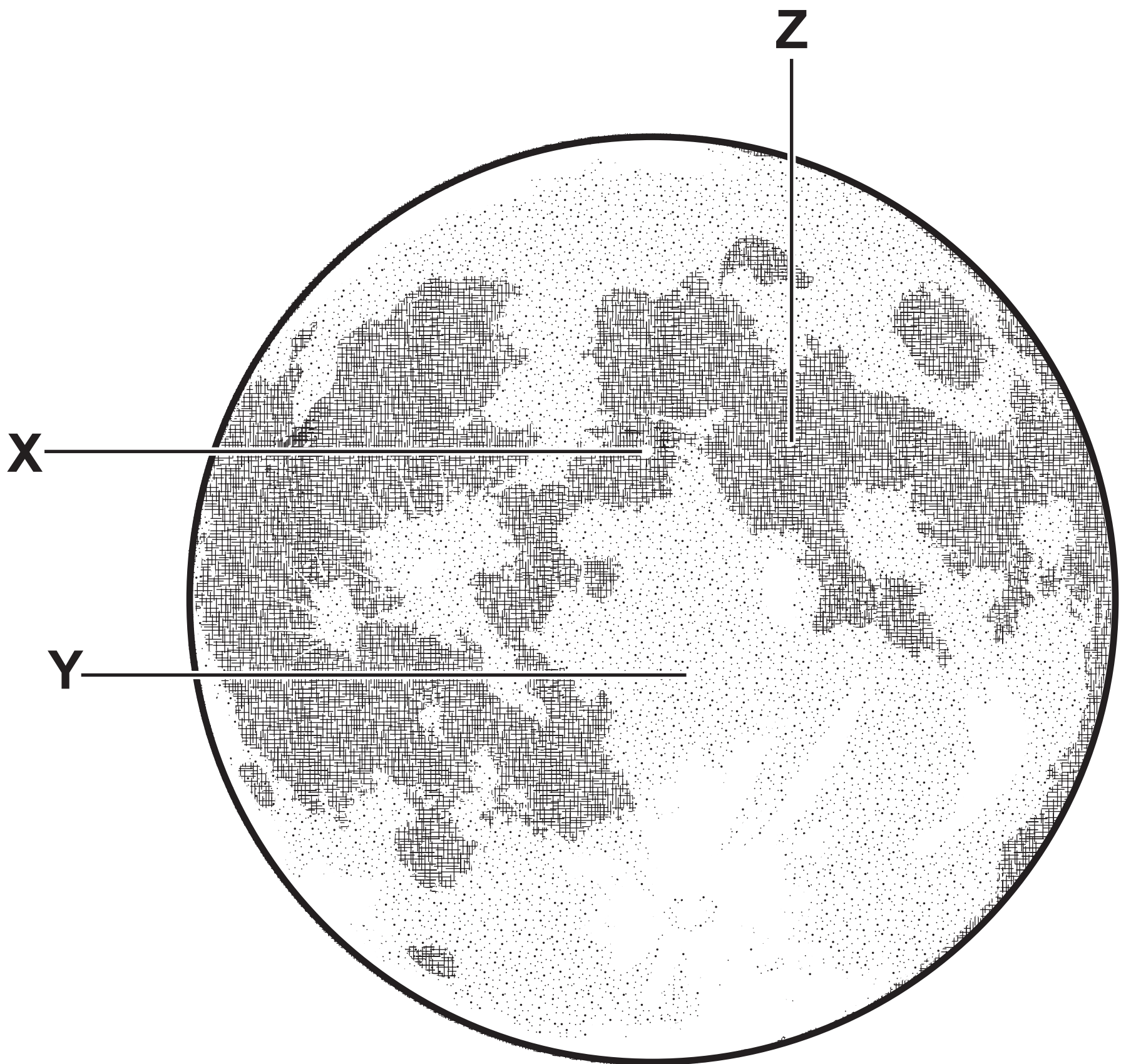
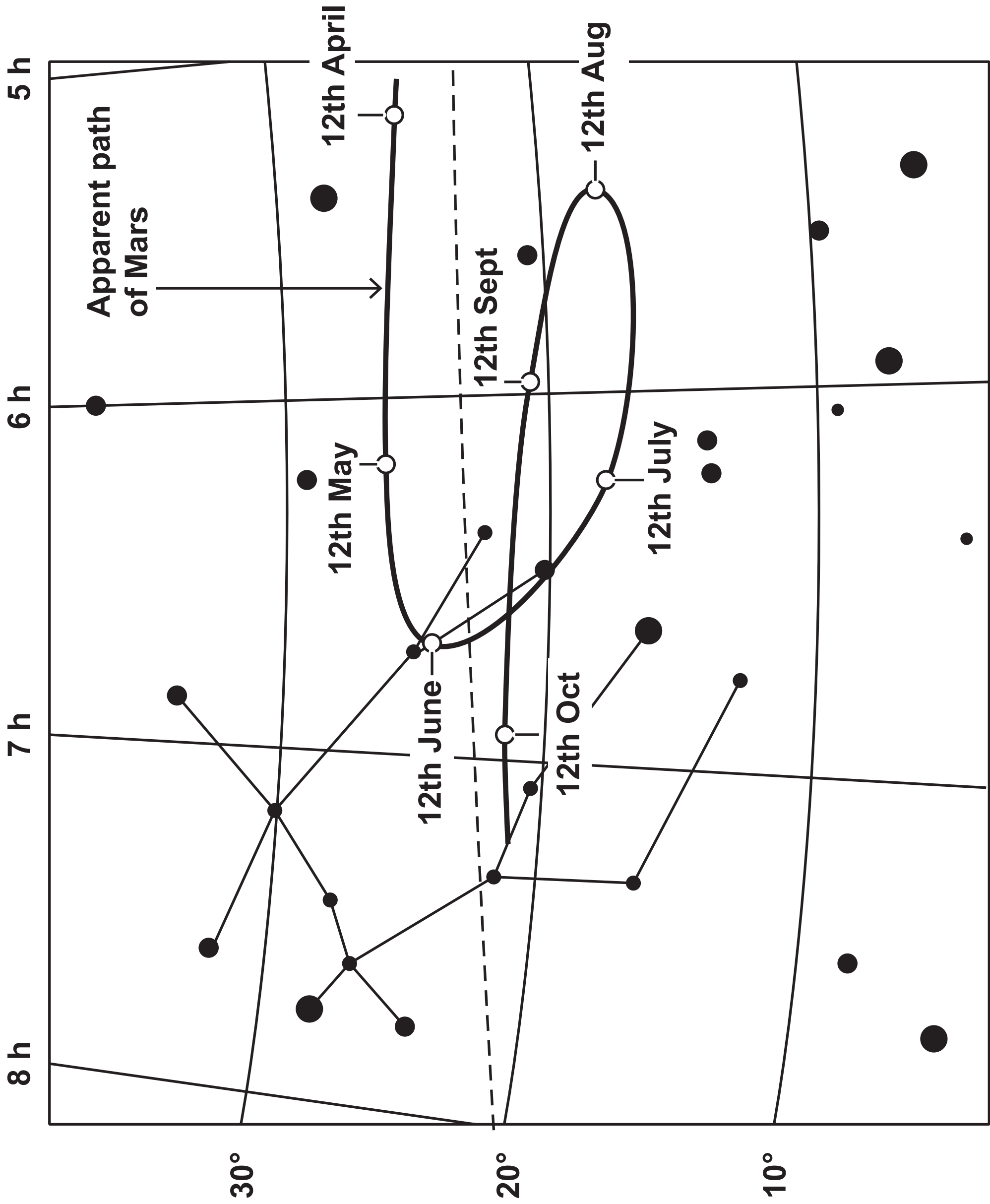


FIGURE 2



Question 4(c) – Blank

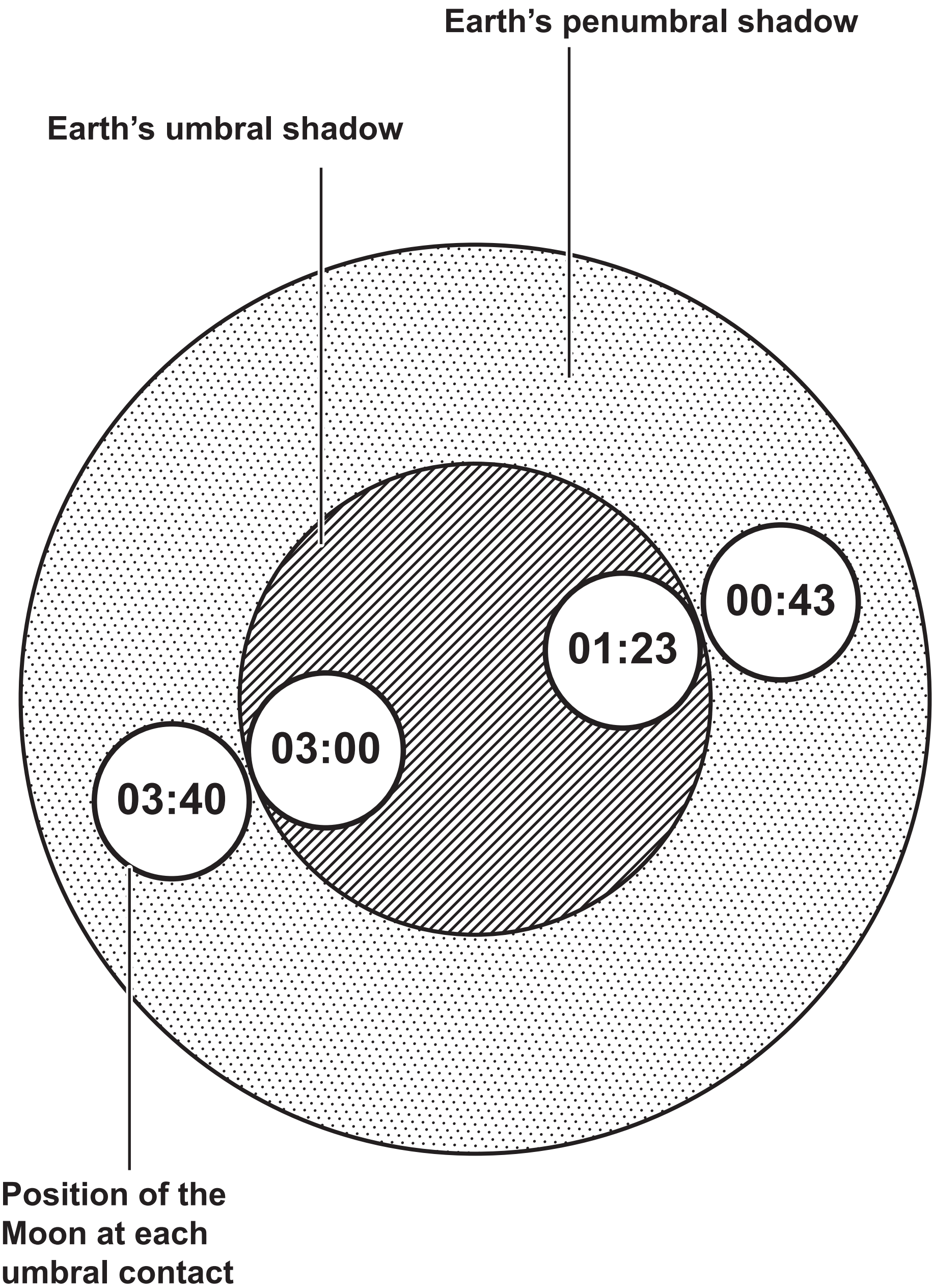
Question 5(a)

TABLE 1

| Date | Level of water (m) | | | |
|--------|--------------------|----------------|------------------|-----------------|
| | First high tide | First low tide | Second high tide | Second low tide |
| 19 Oct | 5·3 | 1·9 | 5·2 | 2·0 |
| 21 Oct | 4·9 | 2·3 | 4·9 | 2·4 |
| 23 Oct | 4·6 | 2·5 | 4·7 | 2·5 |
| 25 Oct | 4·9 | 2·4 | 5·0 | 2·3 |
| 27 Oct | 5·3 | 2·0 | 5·4 | 1·9 |
| 29 Oct | 5·6 | 1·8 | 5·6 | 1·7 |
| 31 Oct | 5·5 | 1·8 | 5·3 | 2·0 |

Question 5(a)(i) – Blank

FIGURE 3

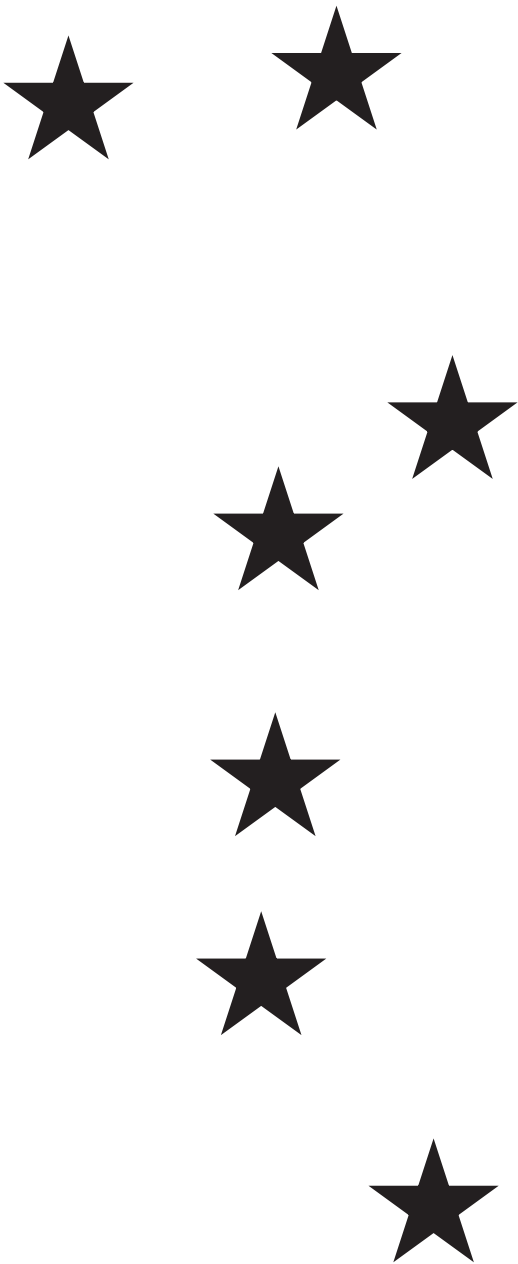


Question 6(c)

TABLE 2

| Moon of Jupiter | Mean orbital radius (million km) | Orbital period (days) |
|-----------------|----------------------------------|-----------------------|
| Io | 0·422 | 1·76 |
| Europa | 0·670 | 3·52 |
| Ganymede | 1·075 | |

FIGURE 4



Question 7(b)

TABLE 3

| Date | Duration of observation (seconds) | Number of times Polaris was observed to twinkle |
|-------------------|--|--|
| 10th March | 25 | 12 |
| 11th March | 15 | 8 |
| 12th March | 30 | 20 |
| 13th March | 20 | 17 |

FIGURE 5

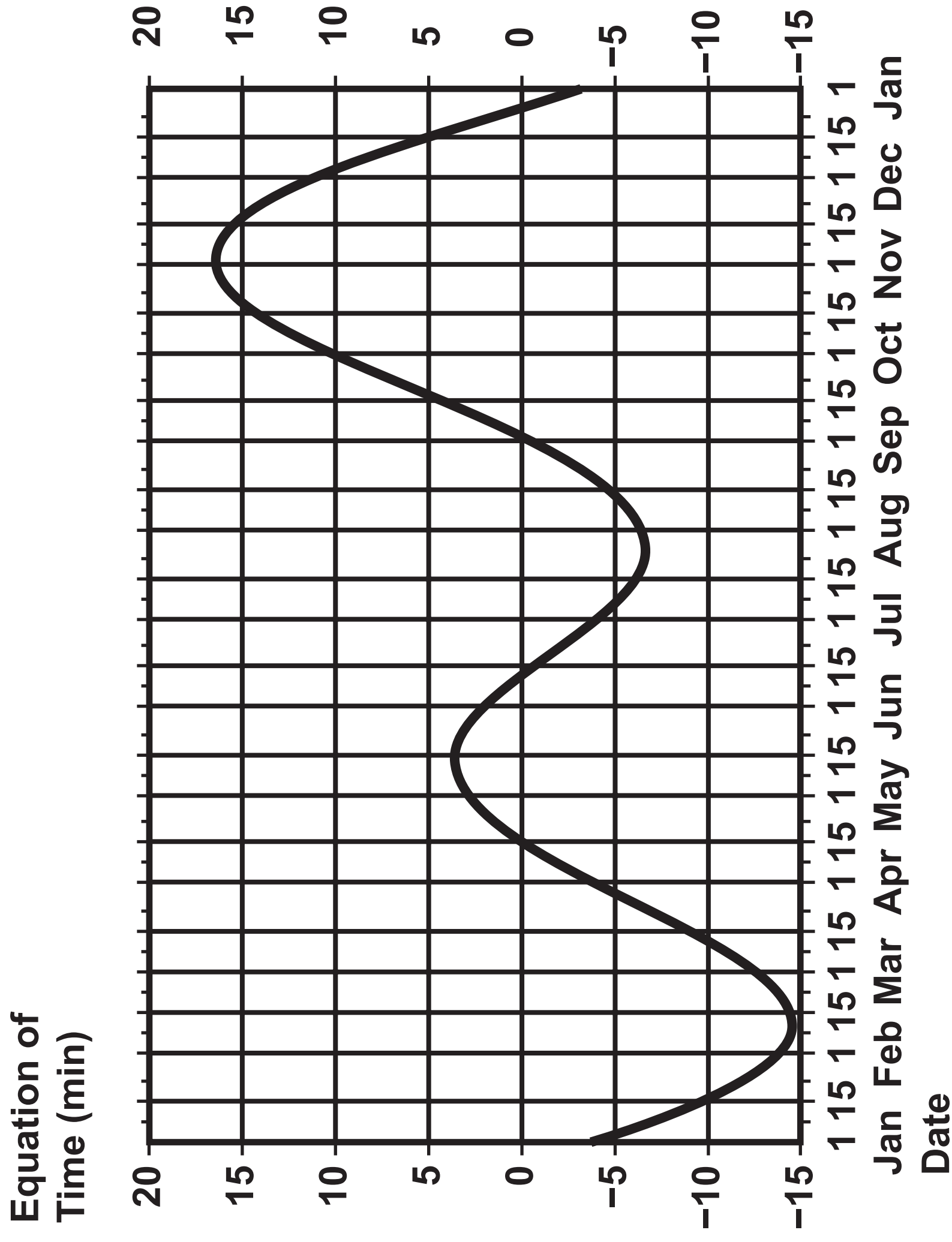


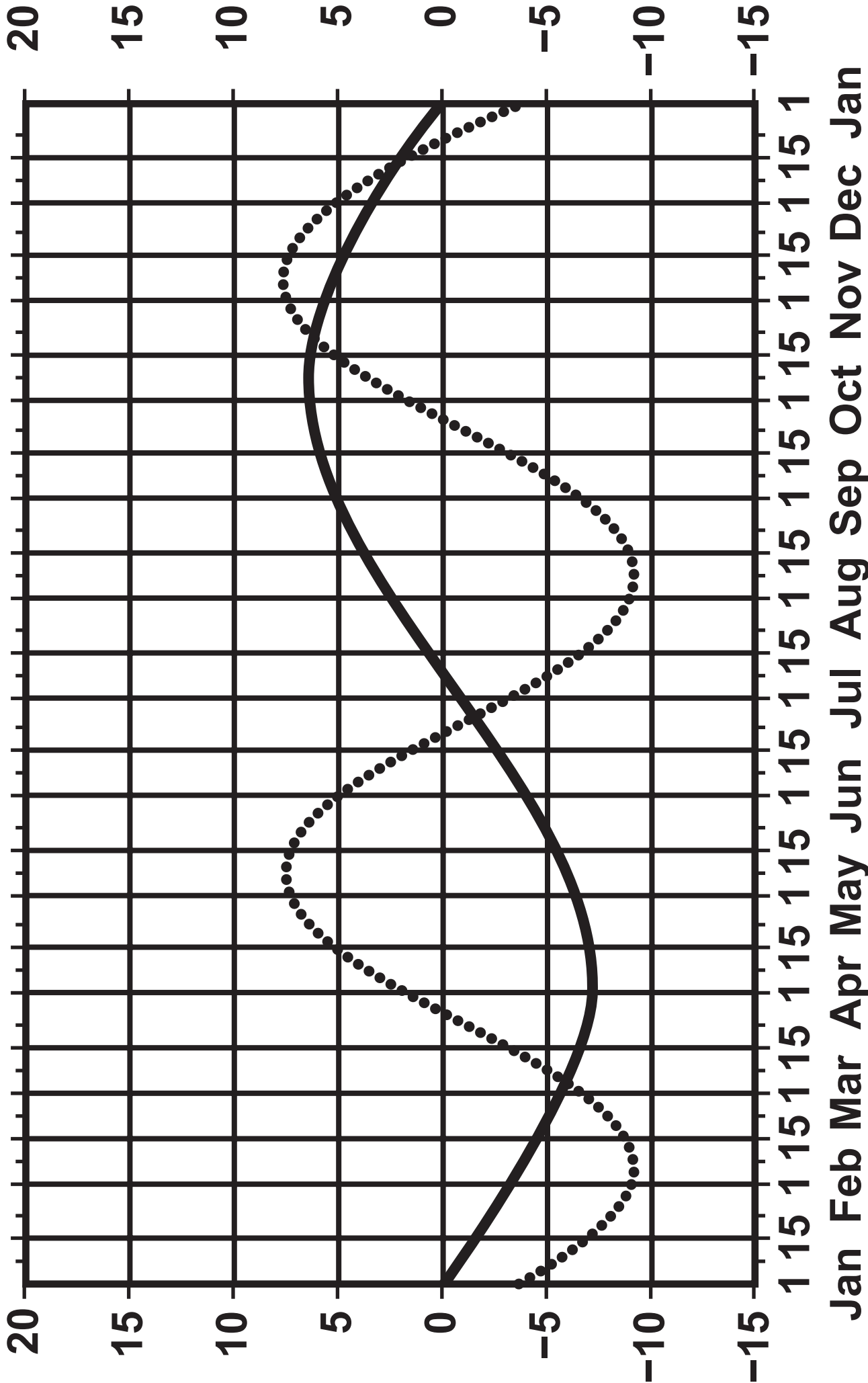
FIGURE 6

KEY

— Earth's elliptical orbit

..... Earth's axial tilt

Equation of
Time (min)



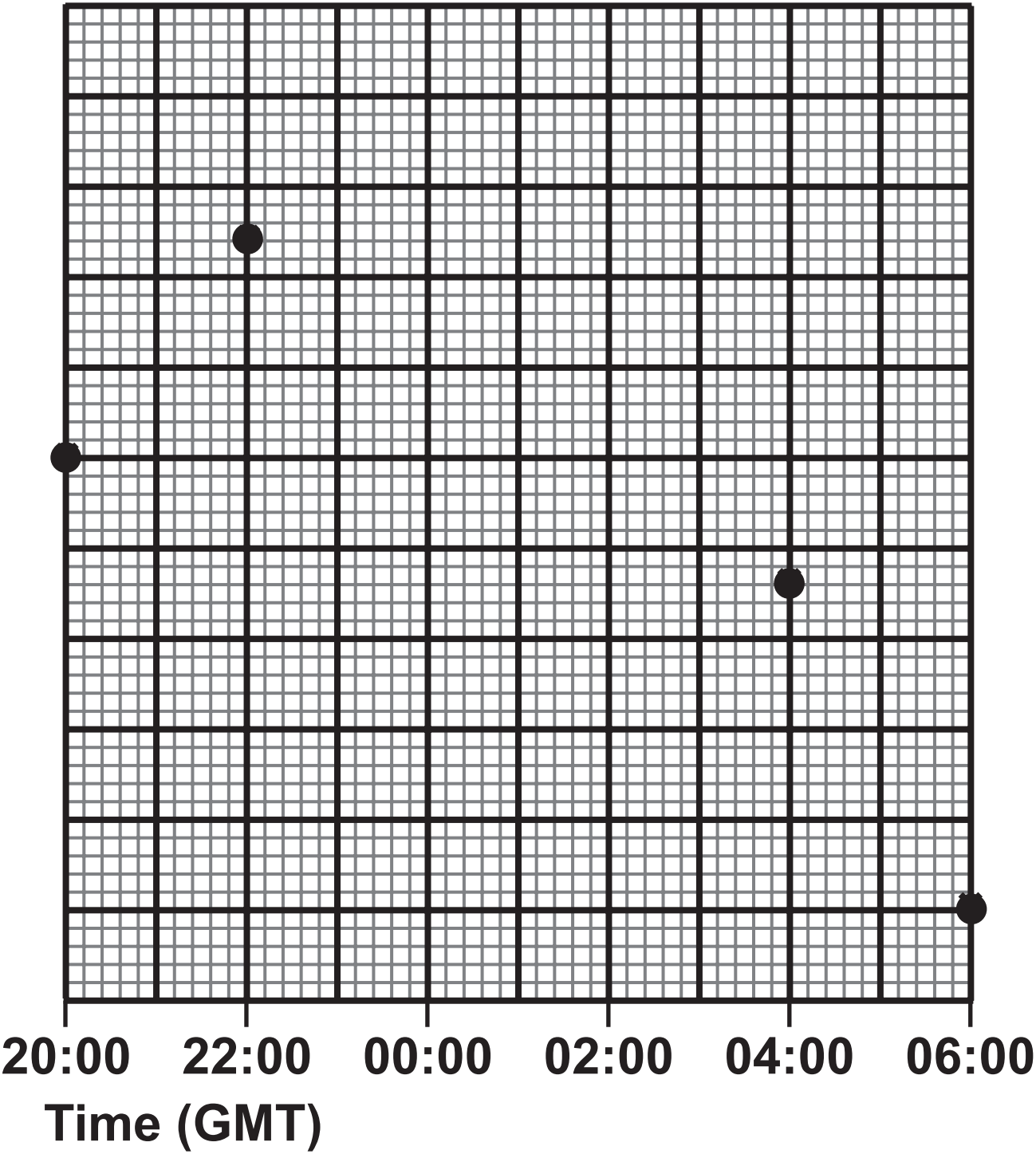
Date

TABLE 4

| Time (GMT) | Altitude of star A (°) |
|------------|------------------------|
| 20:00 | 40 |
| 22:00 | 52 |
| 00:00 | 55 |
| 02:00 | 48 |
| 04:00 | 33 |
| 06:00 | 15 |

FIGURE 7

Altitude of star (°)



Question 5(a)(i) – Blank

FIGURE 4

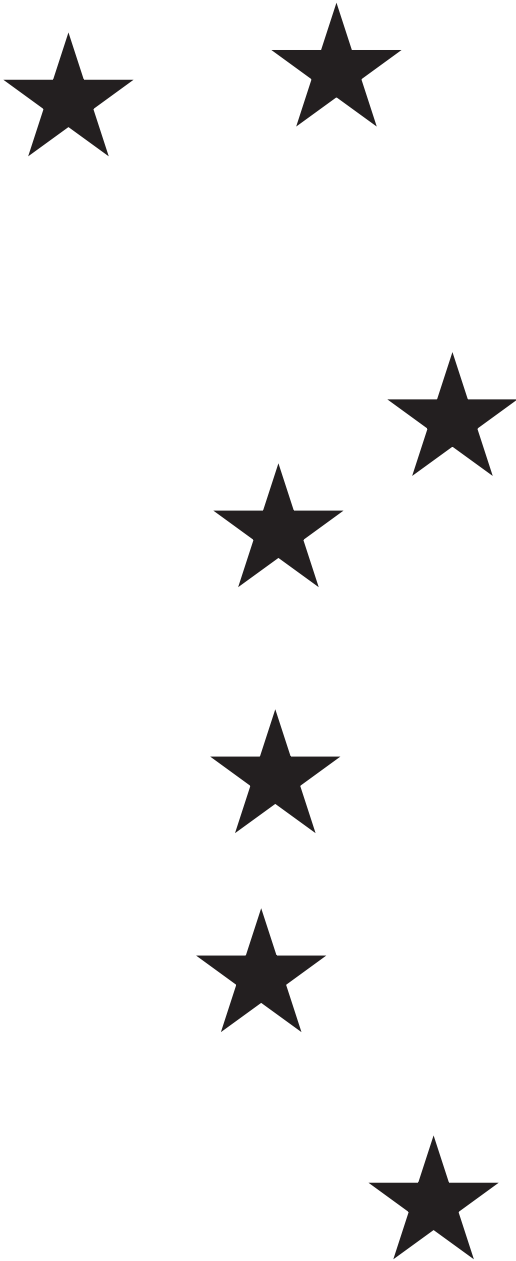


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FIGURE 7

Altitude of star (°)

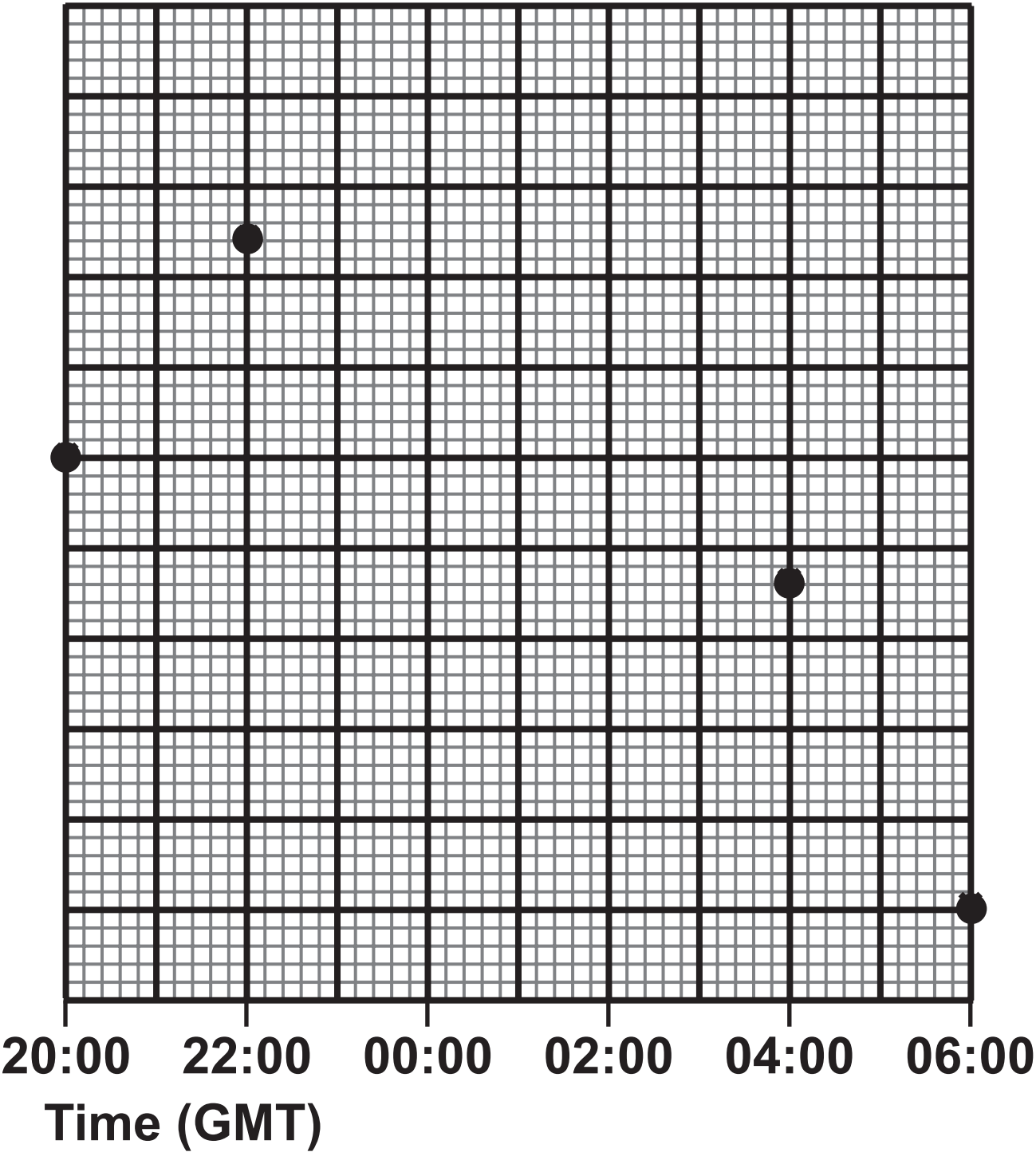


IMAGE CREDITS

**Figure 5 – Source adapted from: © Dominic Ford 2011–2024.
Taken from in-the-sky.org.**