

Astronomy
Paper 2
Telescopic Astronomy

Tuesday 18 June 2024 – Afternoon

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					
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Candidate Number					

INSTRUCTIONS

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

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Spare Copies

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FIGURE 1

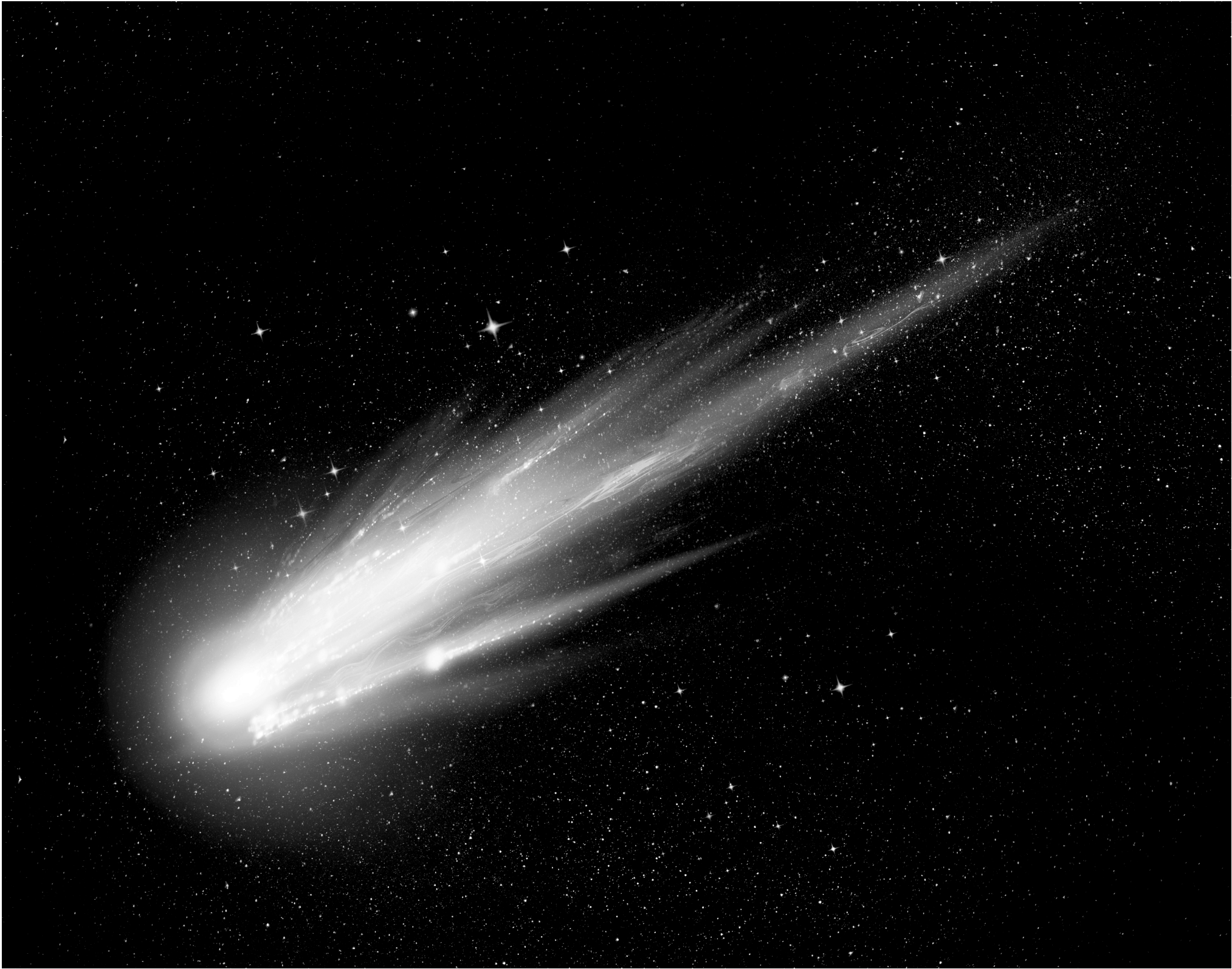


FIGURE 1 (outline)

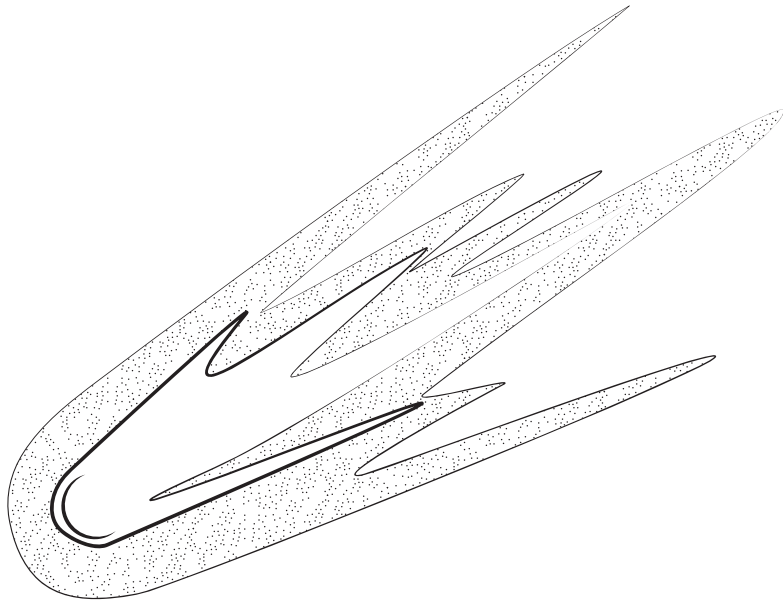


FIGURE 2

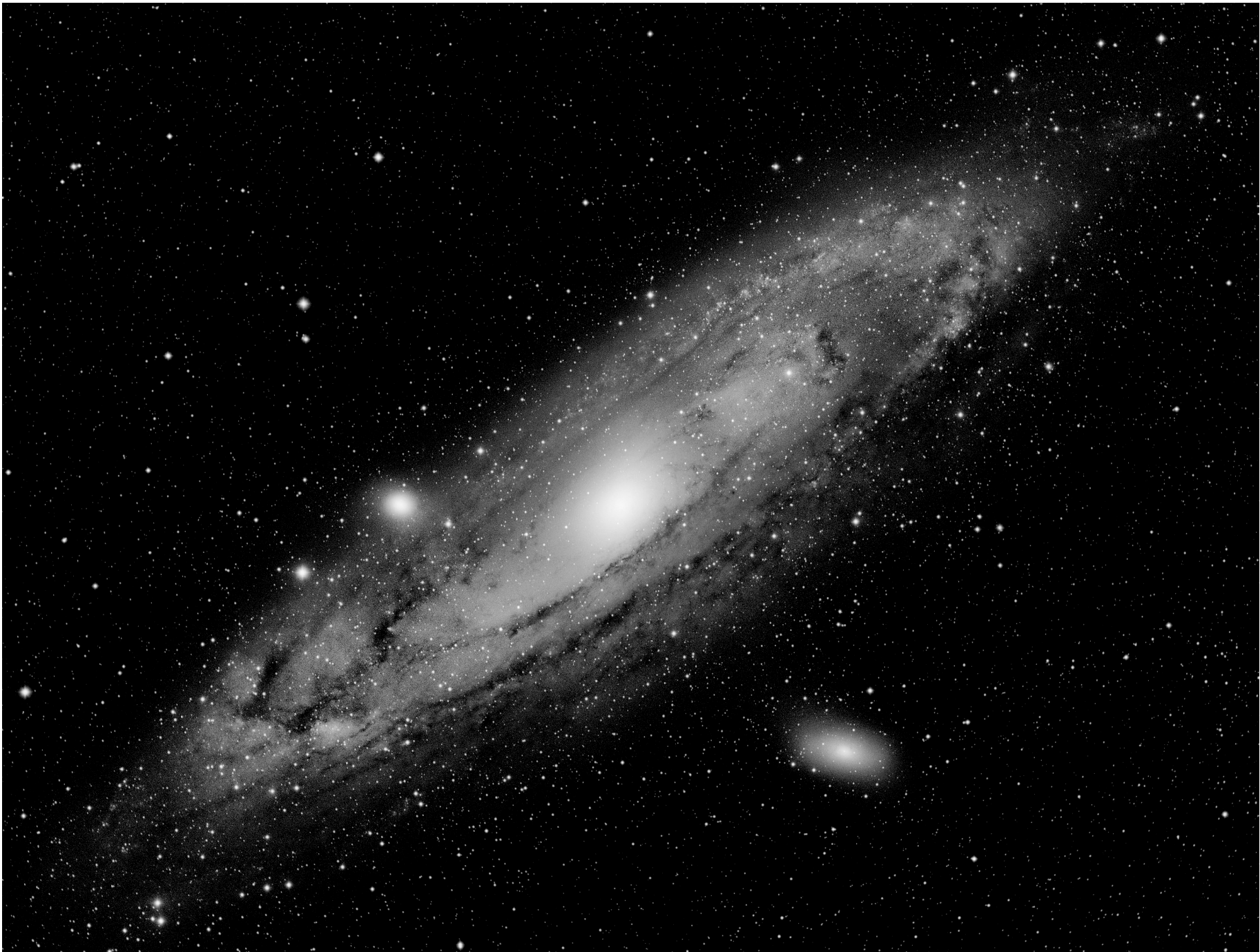
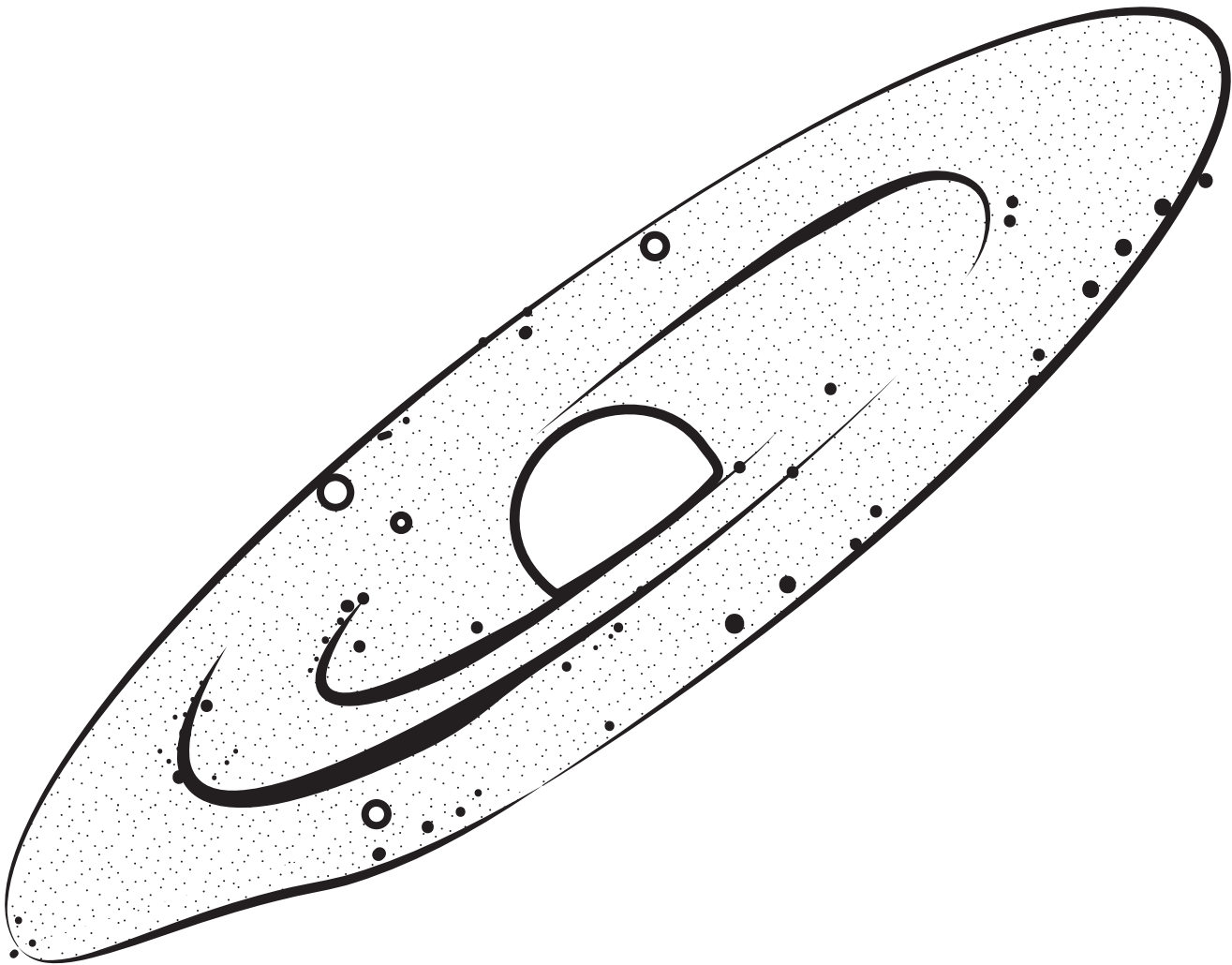
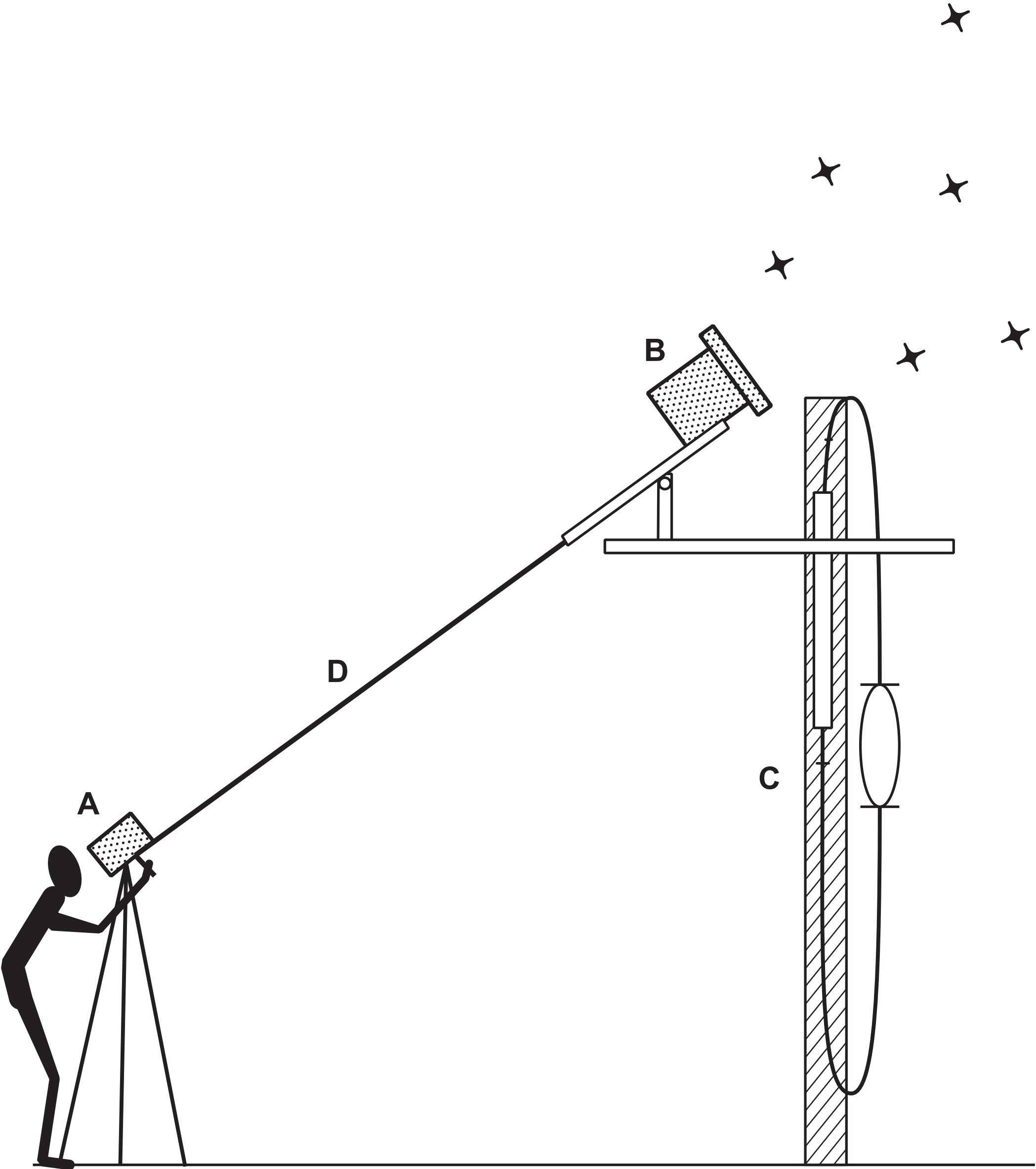


FIGURE 2 (outline)



Question 1(c) – Blank page

FIGURE 3



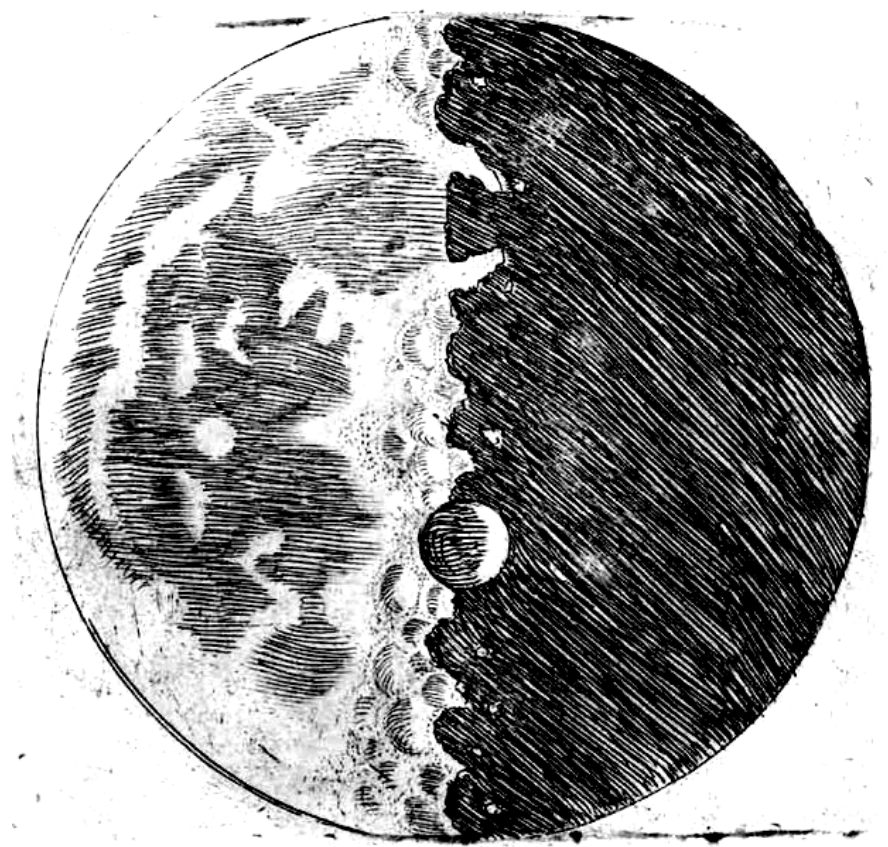
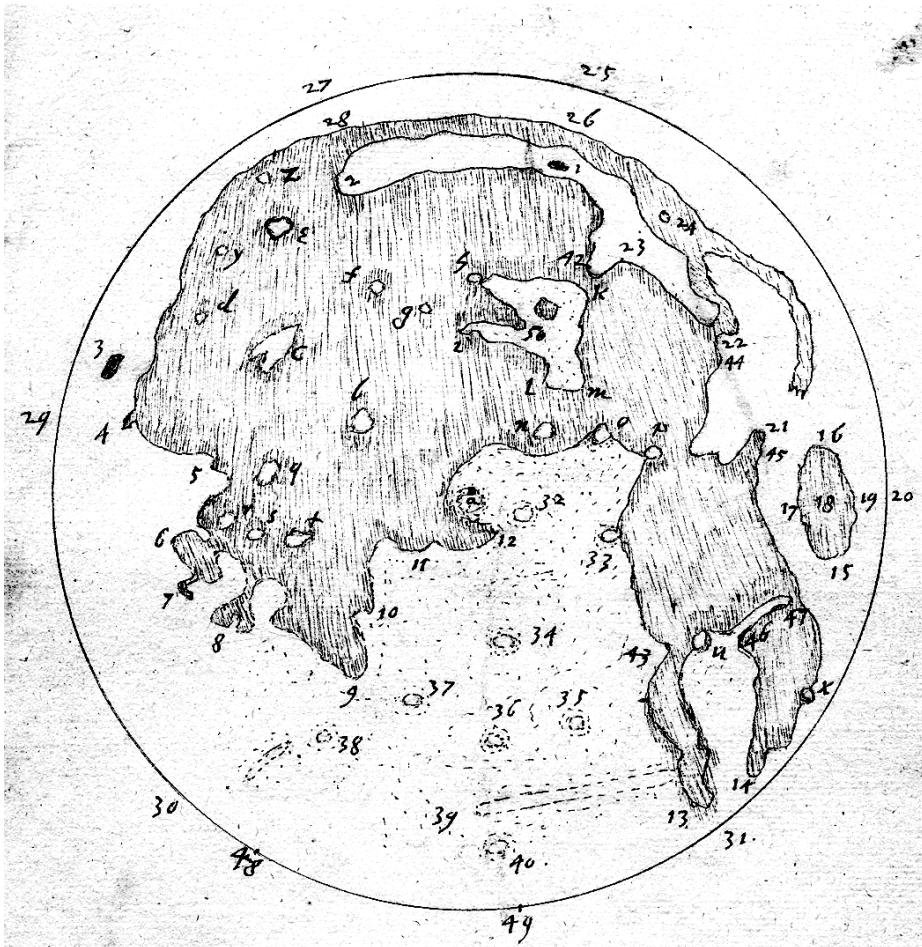
Question 3(a)(ii)

TABLE 1

Aperture	20 cm
Focal length of objective lens	64 m
Focal length of eyepiece lens	130 cm

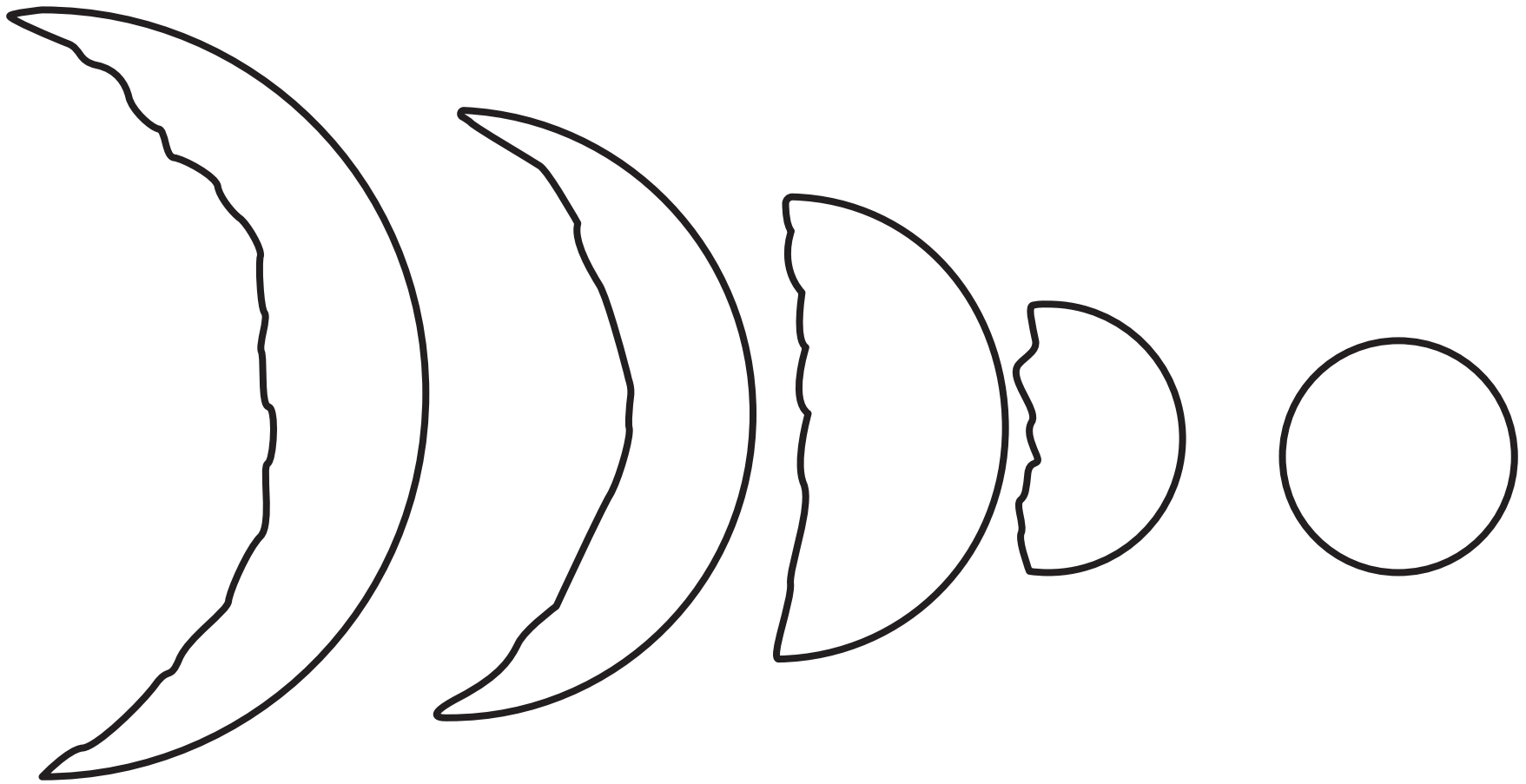
Question 4(a)

FIGURE 4



Question 4(b)

FIGURE 5



Question 5(a)

FIGURE 6

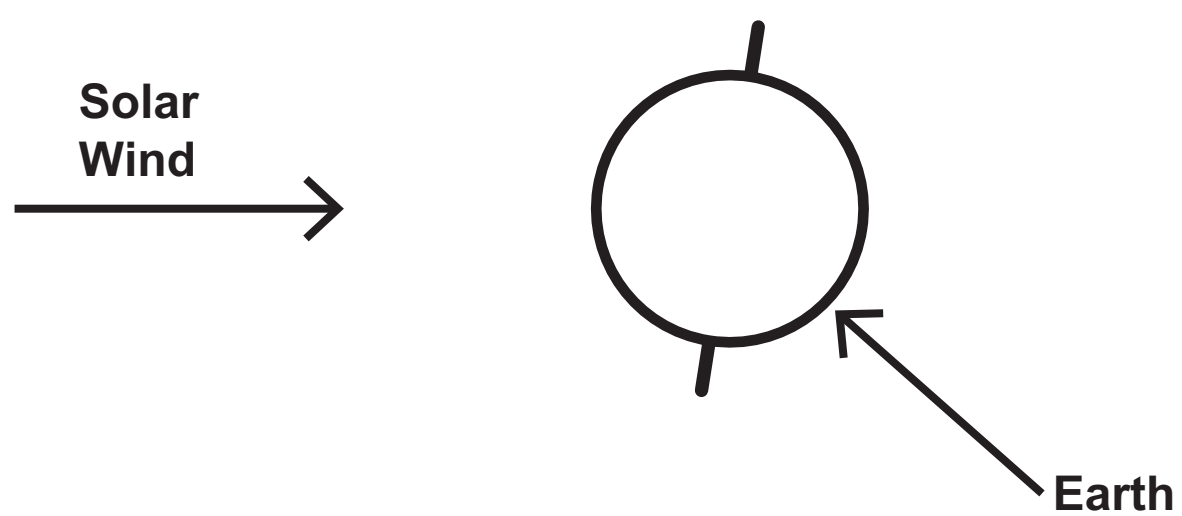
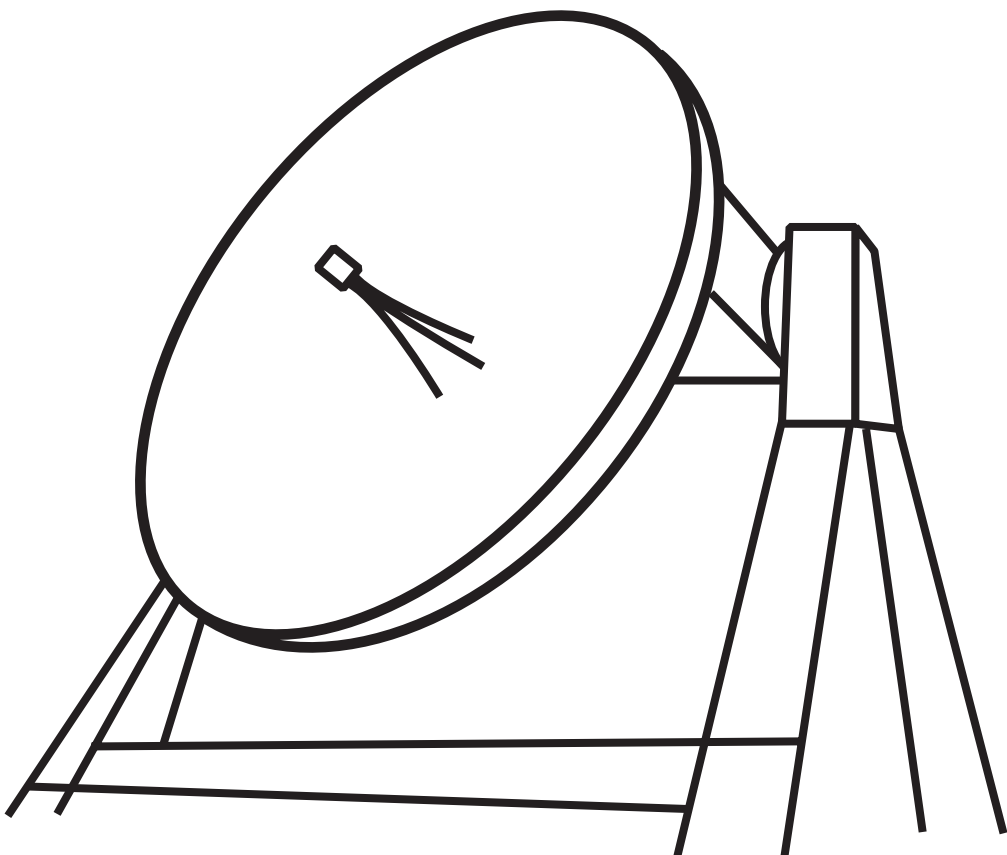


FIGURE 7



FIGURE 7 (outline)

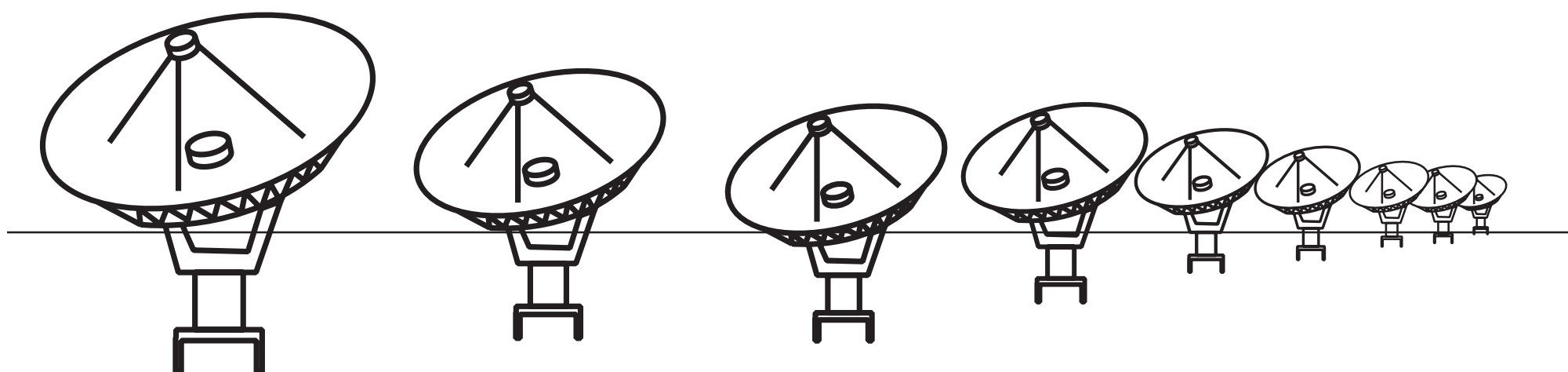


Question 6(b)

FIGURE 8



FIGURE 8 (outline)



Question 7(a)

TABLE 2

Star	Apparent magnitude	Absolute magnitude	Spectral class	Mass (Sun = 1)
61 Virginis	4.74	5.07	G7	0.93
Proxima Centauri	10.5	15.6	M5	0.12
Rigel	0.12	−7.84	B8	18
Aldebaran	0.85	−0.64	K5	1.16
Sirius A	−1.46	1.43	A0	2.1

Question 7(b)

FIGURE 9

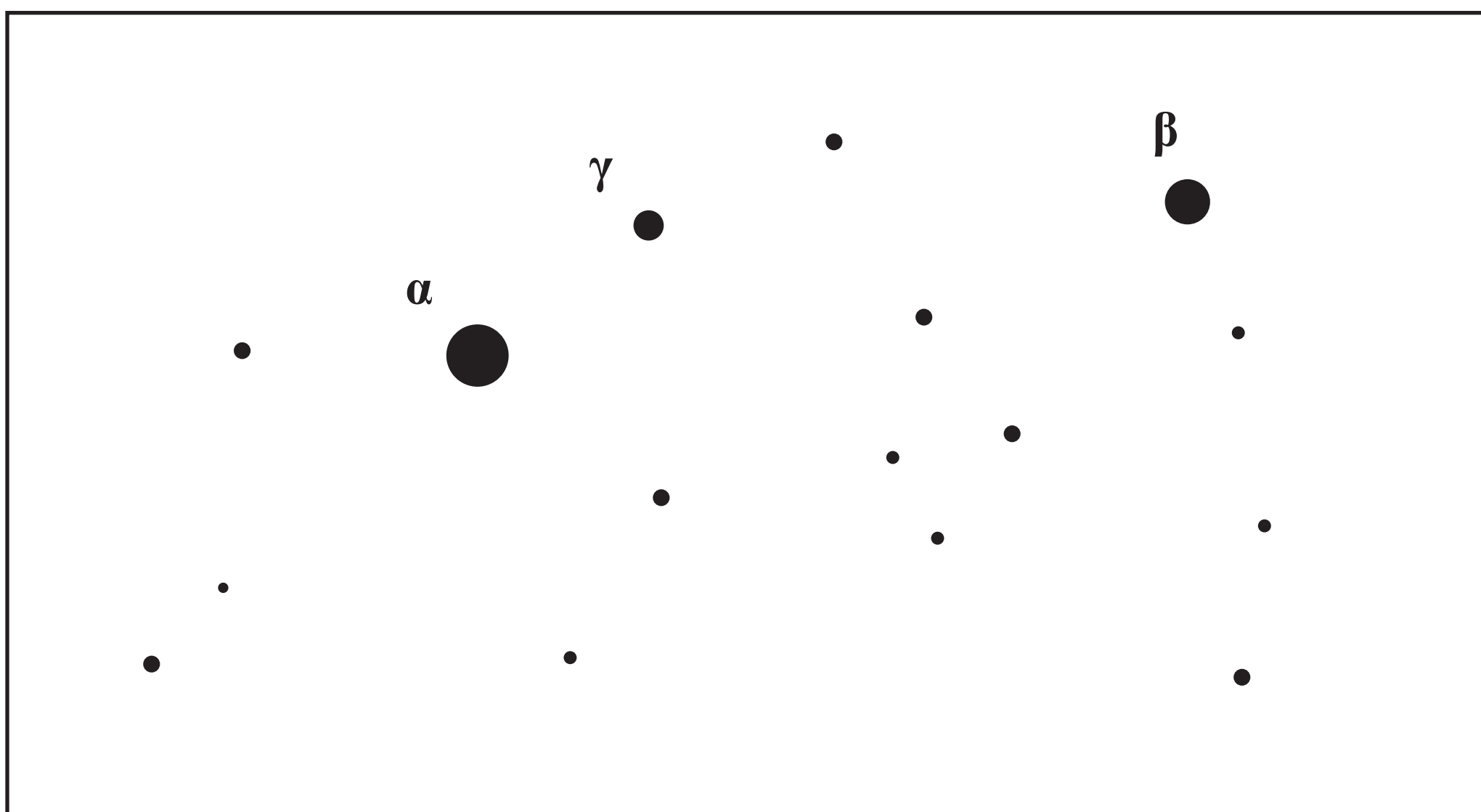


FIGURE 10

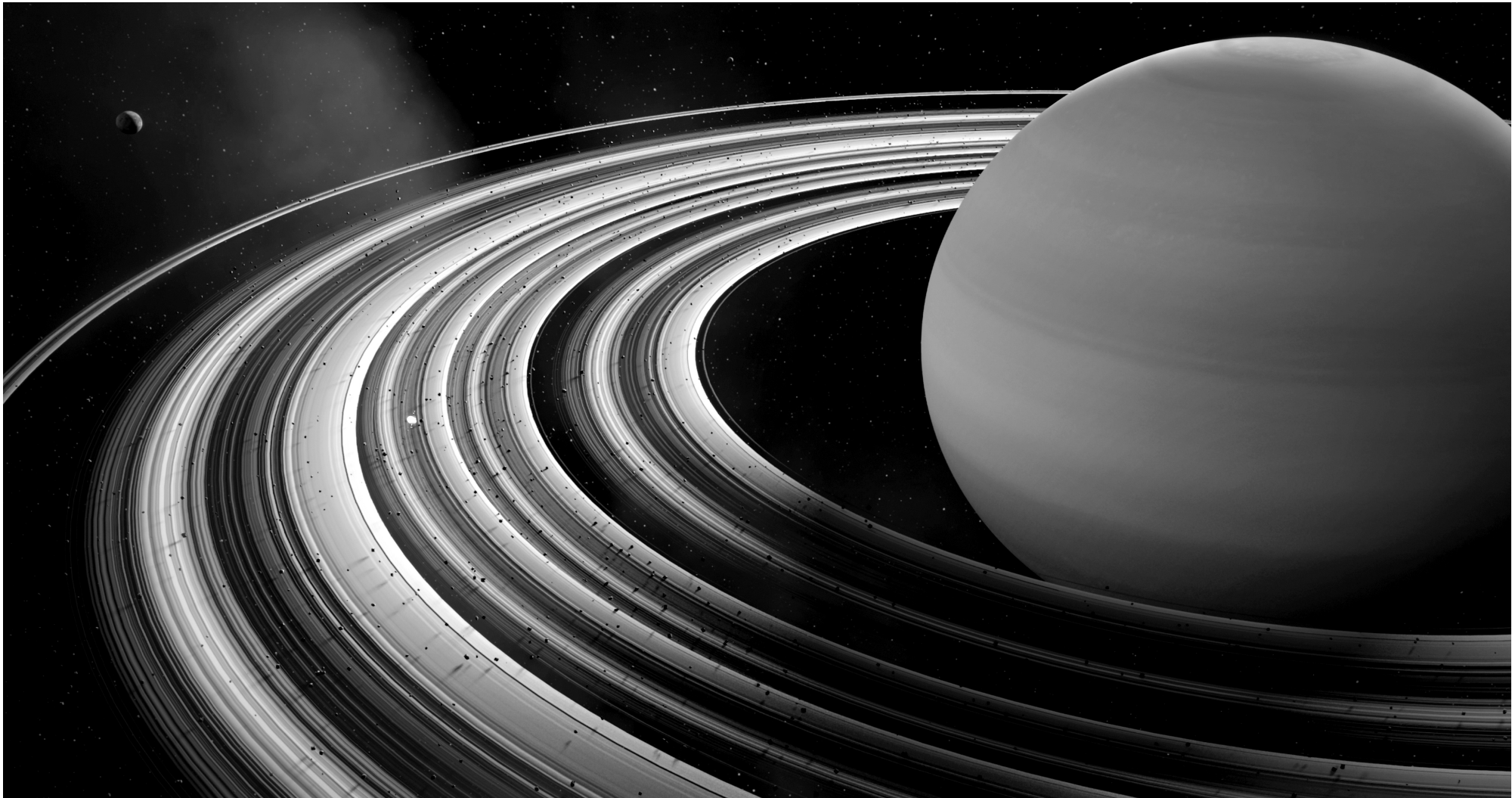


FIGURE 10 (outline)

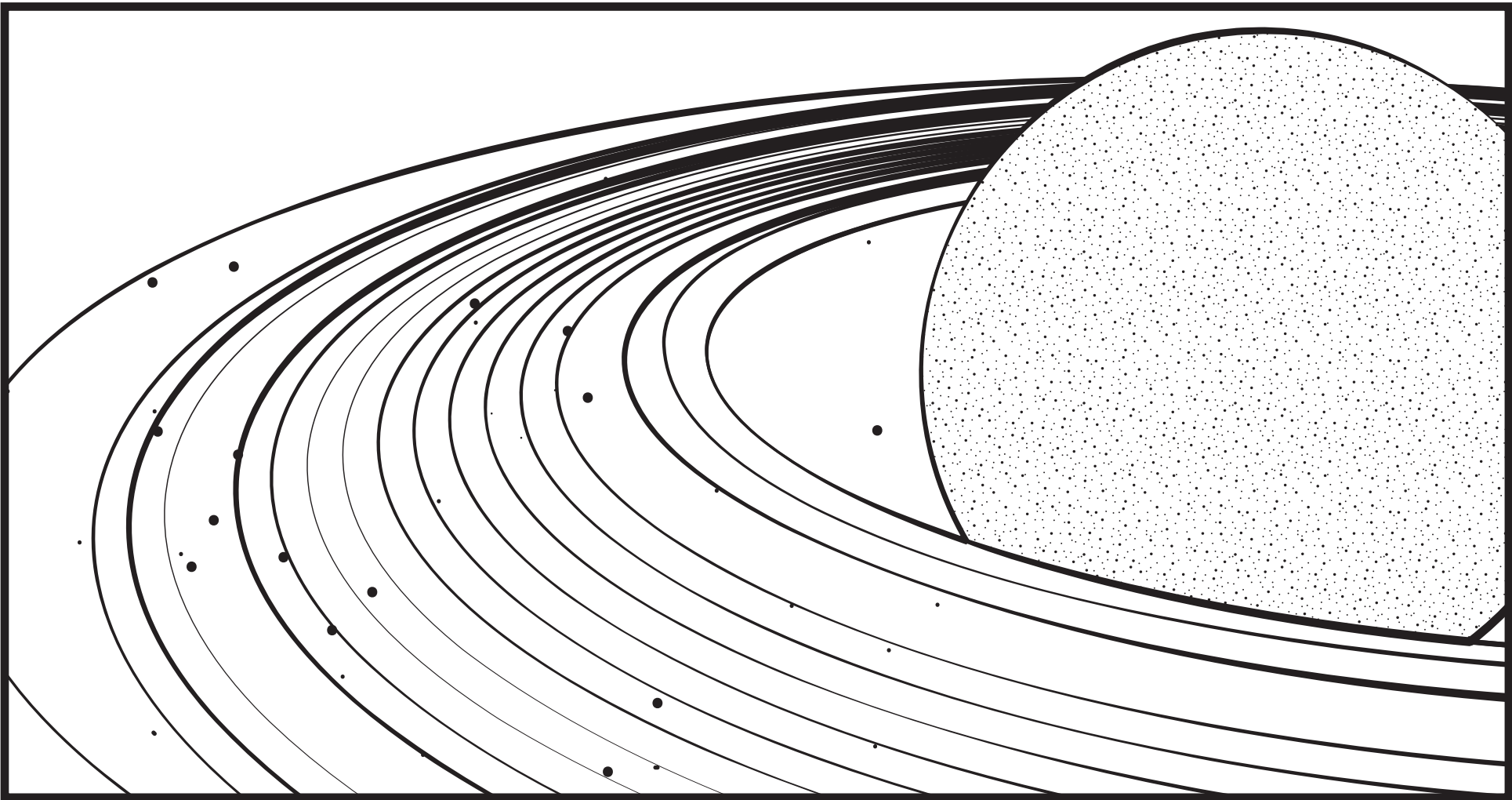


FIGURE 11

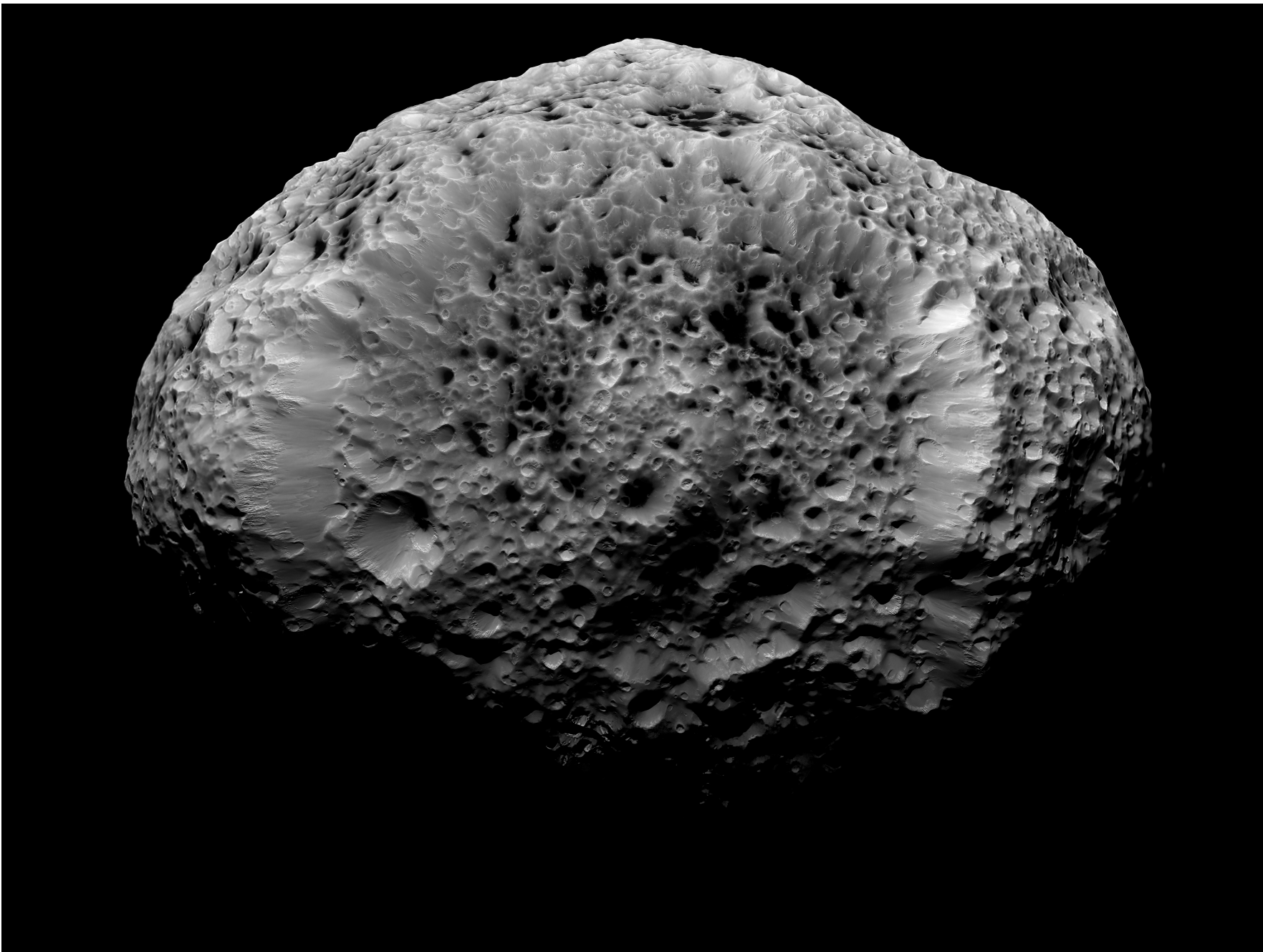
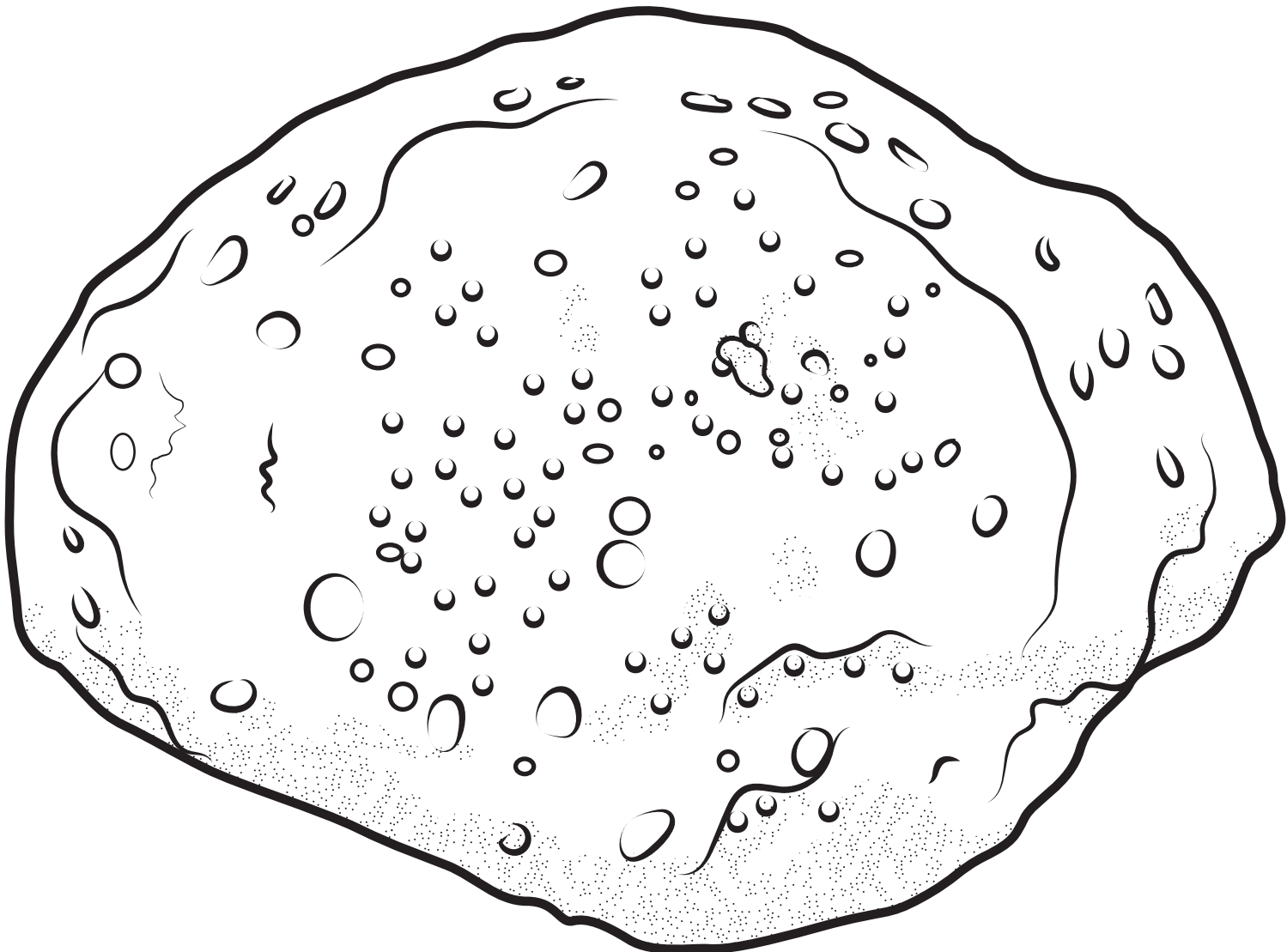


FIGURE 11 (outline)



Question 8(c)

FIGURE 12

Number of
asteroids

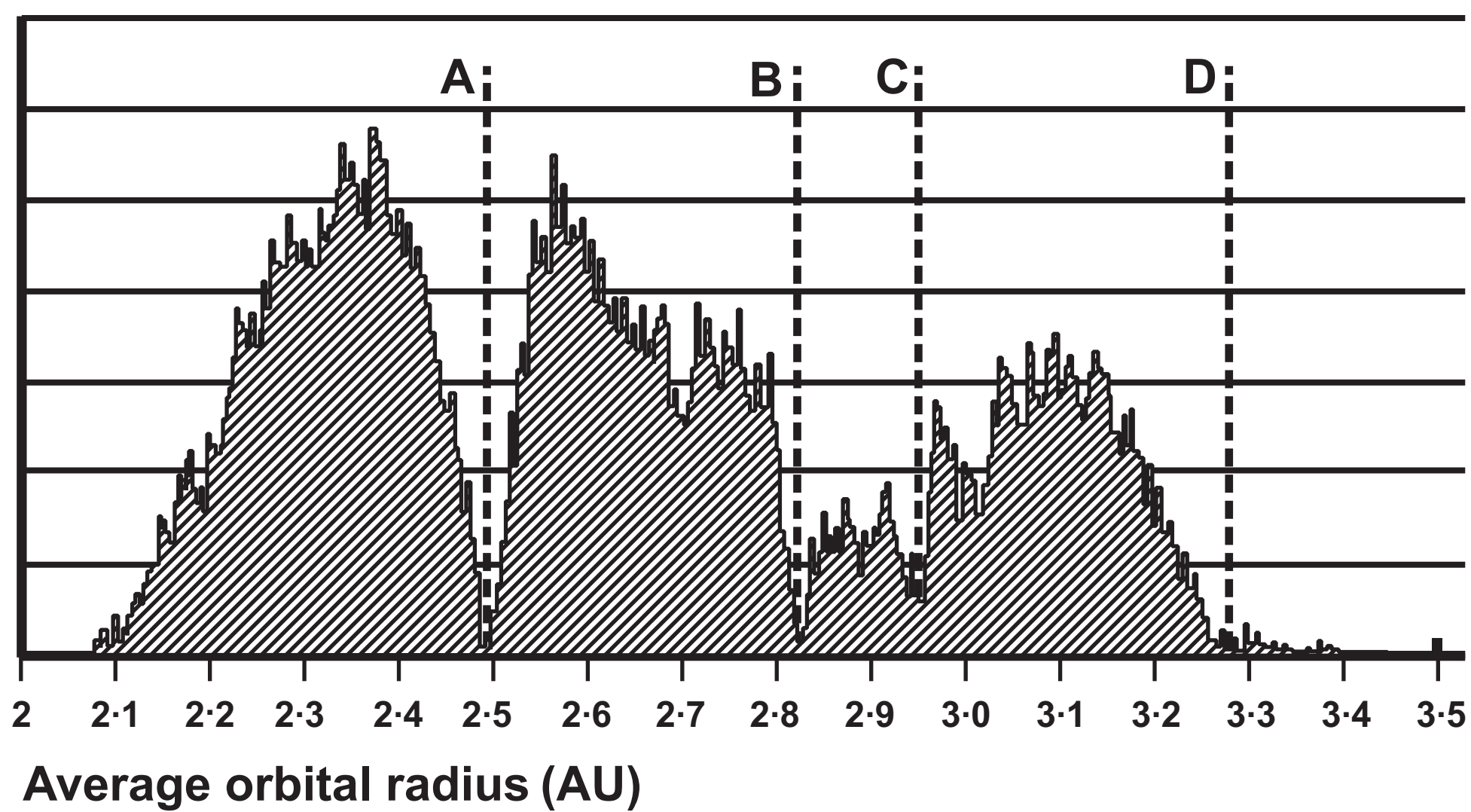
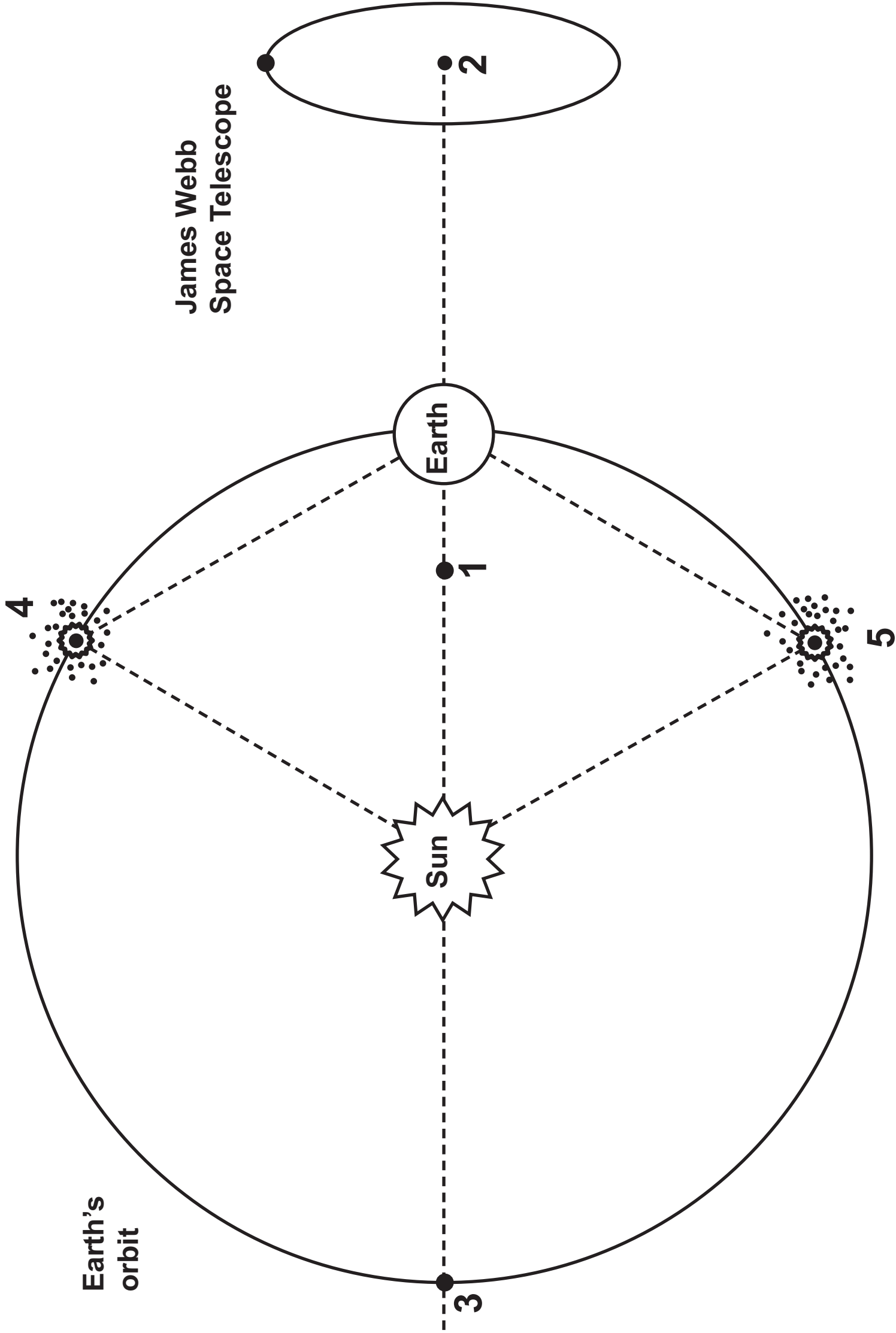


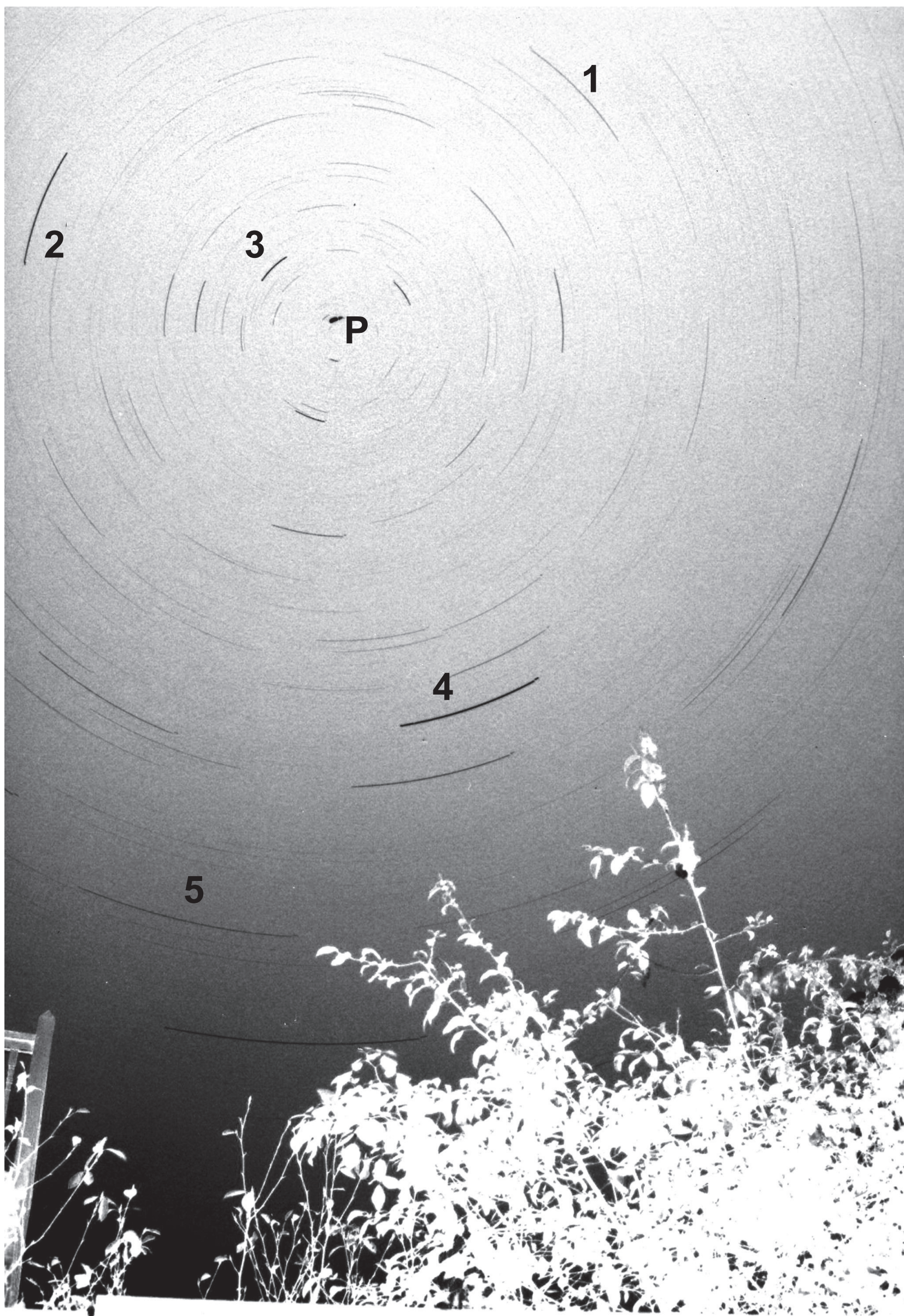
FIGURE 13

NOT TO SCALE



Question 9(a)

FIGURE 14

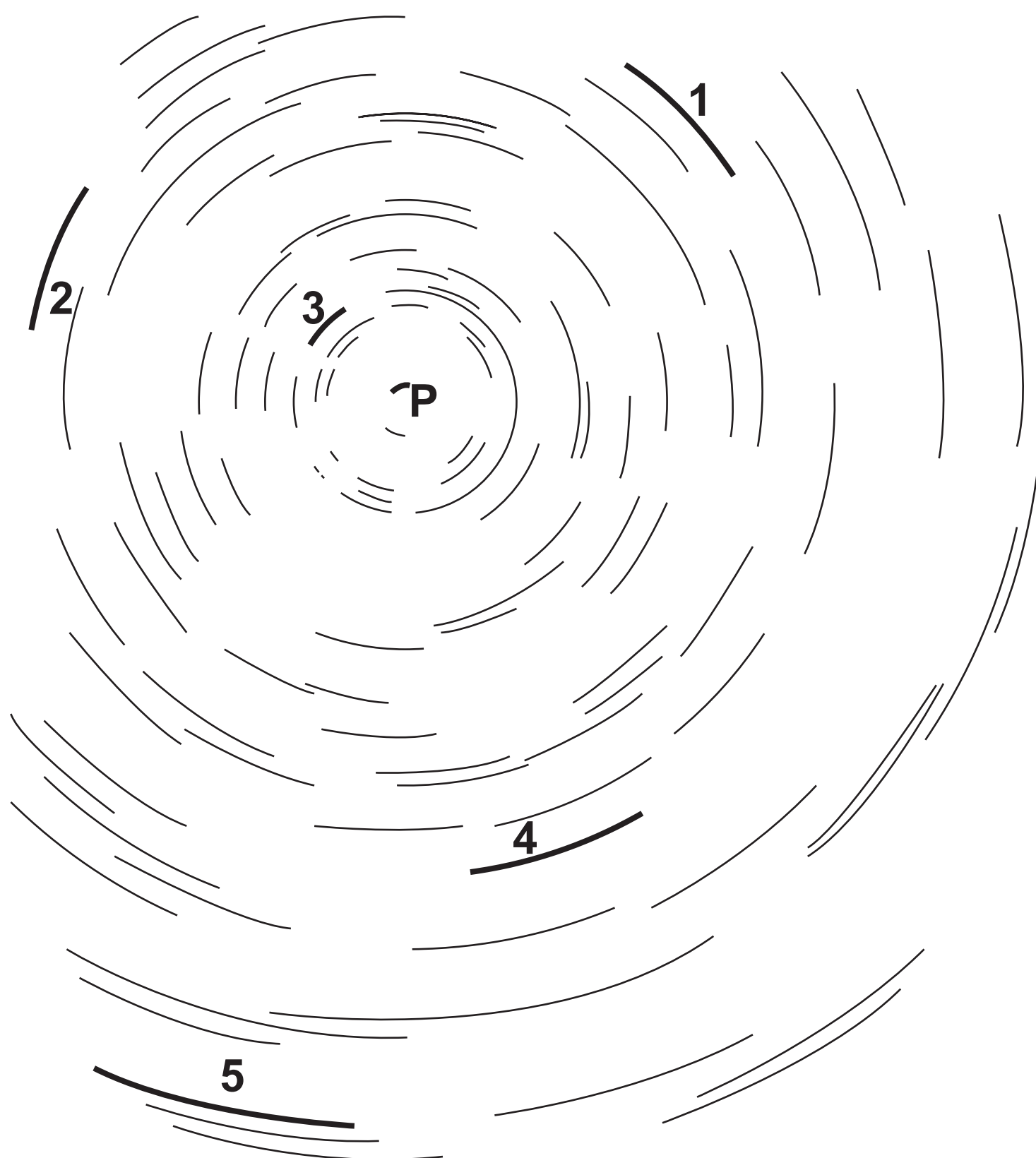


(continued on the next page)

Turn over

Question 9(a) continued.

FIGURE 14 (outline)



(continued on the next page)

Turn over

Question 9(a) continued.

TABLE 3

Star Trail	Angle (°)
1	23
2	26
3	28
4	24
5	25

Question 9(c) – Blank page

Question 10(b)

TABLE 4

Quantity	Estimate
Rate of star formation in the Milky Way galaxy	1·1 per year
Fraction of these stars WITHOUT planets	0·6
Average number of habitable planets orbiting each star with planets	2

Question 10(b)(ii)

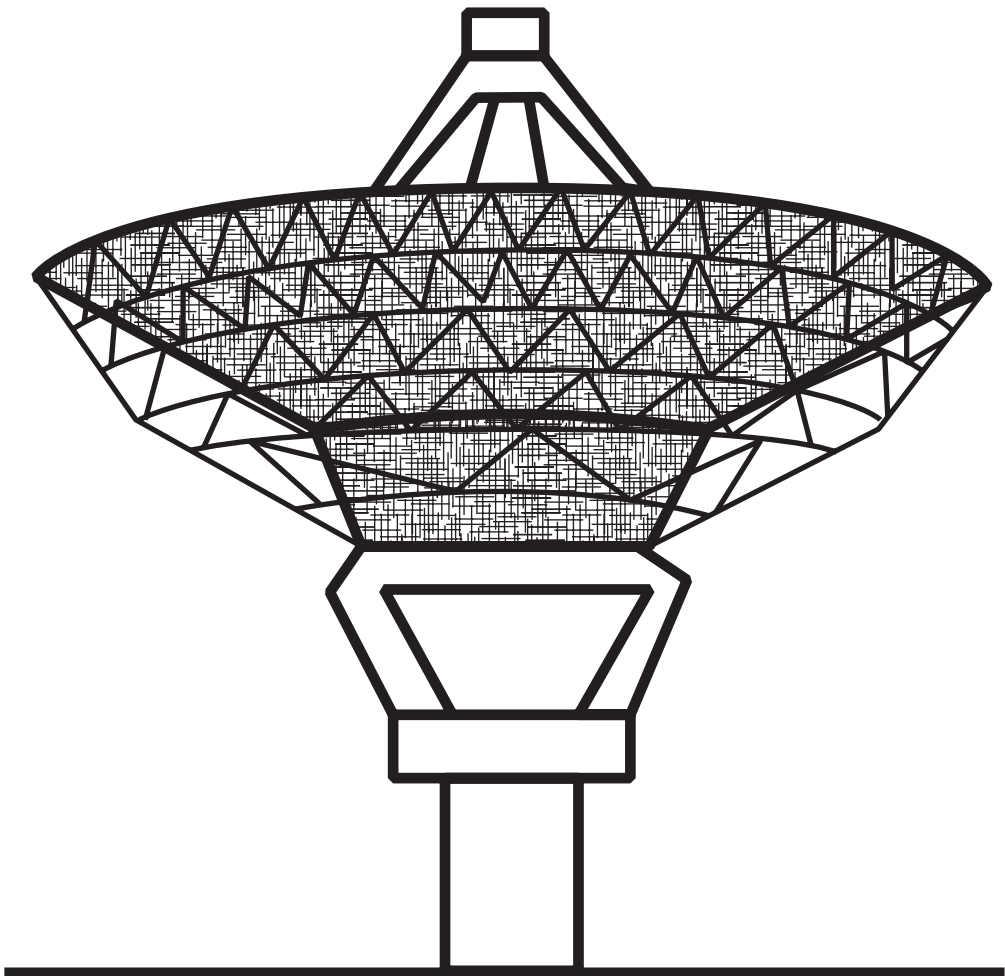
TABLE 5

Quantity	Estimate
f_l	1·0
f_i	1·0
f_c	0·15
L	50 000 000

FIGURE 15



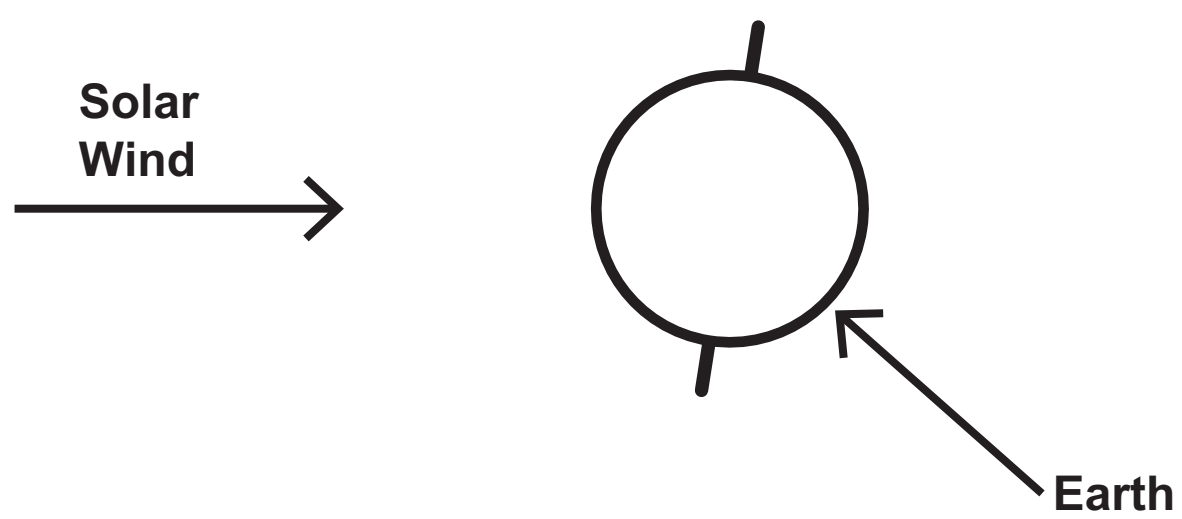
FIGURE 15 (outline)



Question 1(c) – Blank page

Question 5(a)

FIGURE 6



Question 9(c) – Blank page

IMAGE CREDITS

Figure 1

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Figure 2

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Figure 7

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Figure 8

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Figure 10

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Figure 11

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Figure 15

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