

GCSE Physics B (Twenty First Century Science)

J259/03 Depth in physics (Higher Tier)

Question Set 30

1 Planets outside our solar system have been discovered orbiting a star called Kepler-106.

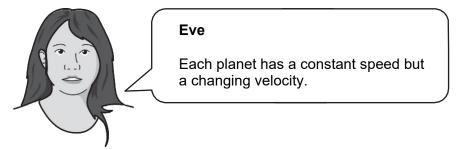
Table 4.1 shows the properties of these planets. Assume that the planets move in **circular** orbits.

| Planet | Radius of orbit (km) | Time to complete one orbit (s) | Speed (m / s) | Mass (kg) |
|--------|-------------------------|-----------------------------------|---------------|-------------|
| 1 | 9.87 × 106 | 5.36 × 105 | 116 000 | 2.73 × 1024 |
| 2 | 1.66 × 107 | 1.18 × 106 | 89 000 | 6.26 × 1025 |
| 3 | 3.59 × 107 | 3.80 × 106 | 59 000 | 3.87 × 1025 |

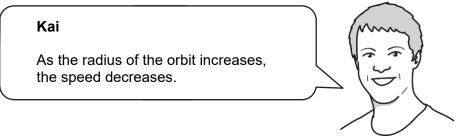
Table 4.1

(a) Calculate the momentum of planet 1.

(b) Eve and Kai look at the information in **Table 4.1**.



(i) Explain why Eve is correct.



(ii) Suggest why Kai is correct.

Total Marks for Question Set 30: 7

[2]

[2]



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