

- 3 Jupiter is the largest planet in the solar system. It has over sixty moons. The four largest moons were observed by Galileo using his telescope over four hundred years ago.

The table displays some of the data on these four largest moons which is now known to scientists.

Name	Distance from Jupiter in kilometres	Time to orbit Jupiter in days	Diameter in kilometres	Mass in quintillion tonnes
Callisto	1 883 000	16.9	4806	108
Europa	671 000	3.6	3130	48
Ganymede	1 070 000	7.2	5268	148
Io	422 000	1.8	3630	89

1 quintillion tonne = 1 000 000 000 000 000 000 tonnes

- 3 (a) A centripetal force acts on each of these moons.

State clearly what provides the centripetal force.

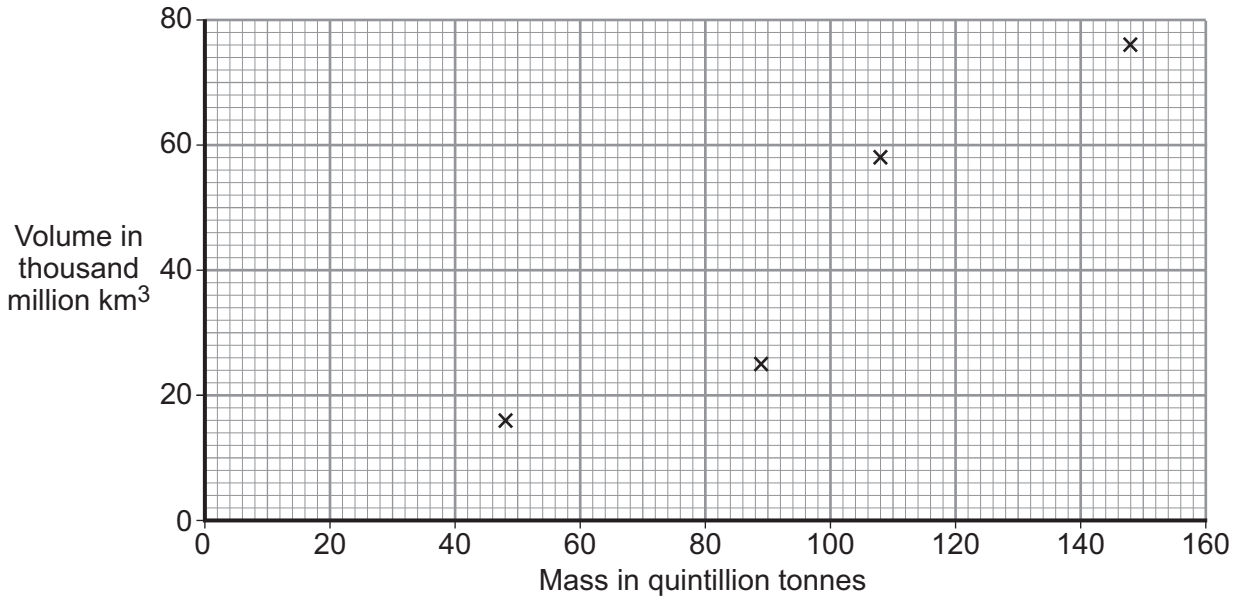
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(1 mark)



3 (b) The graph shows the volume against mass for these large moons.



Use the graph to estimate the volume of a moon with a mass of 20 quintillion tonnes.

Show clearly on the graph how you used it to get to your estimate.

Estimated volume of moon = thousand million km³
(2 marks)

3 (c) For these large moons, what is the relationship, if any, between the moon's distance from Jupiter and the time it takes for the moon to orbit Jupiter?

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 (1 mark)

3 (d) One reason why astronomers now have more data on the moons of Jupiter is that present-day astronomers have telescopes which are much more powerful than Galileo's telescope.

Give **one** other reason.

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 (1 mark)

5

Turn over ►

