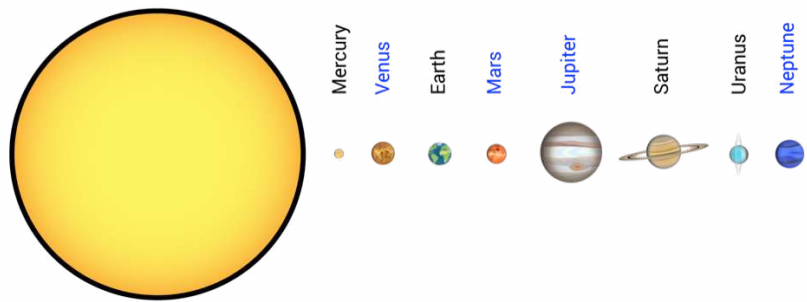


0	1
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The Sun is orbited by eight planets.



0	1	.	1
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Write down the names of the planets labelled W, X, Y and Z in the above diagram.

W **Venus**

Y **Jupiter**

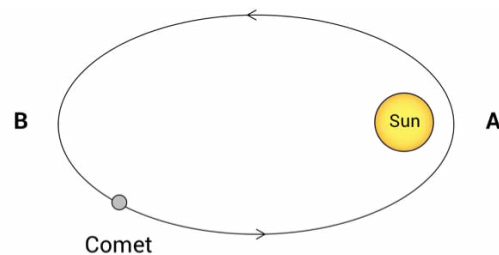
X **Mars**

Z **Neptune**

(4 correct – 2 marks; 2 or 3 correct – 1 mark)

0	1	.	2
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Comets also orbit the Sun. Their orbits are highly elliptical and eccentric, as shown in the below diagram.



Describe and explain how the speed at which a given comet is moving changes between points A and B in its orbit (as shown above).

A comet will travel more quickly at A than at B [1]. As it approaches the Sun, it will be accelerated due to the gravitational force acting on it [1] (or as it travels away from the Sun, it will be decelerated due to the gravitational force acting on it).

This question can also be answered in terms of energy changes: as the comet approaches the Sun, its GPE decreases and its KE (and therefore its speed) increases; as it travels away from the Sun, the opposite process happens.

0	1	.	3
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Ceres, Eris, Pluto, Haumea and Makemake are all classified as being dwarf planets. What is a dwarf planet?

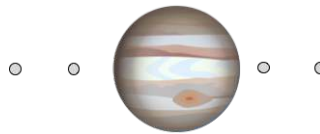
Any ONE of: a planet-like object; large enough for gravity of have made it (roughly) spherical in shape; an object which has not yet 'cleared its orbit' of debris.

0	2
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People used to believe that the Earth was at the centre of the Solar System (in other words, that the Solar System was *geocentric*), with the other planets and the Sun in orbit around it. In 1543, Copernicus published his *heliocentric* model which placed the Sun at the centre. This model was supported by the observation by Galileo in 1610 of the largest moons of Jupiter and of the phases of Venus.

0	2	.	1
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Explain how the observation of the orbiting of four moons around Jupiter led people to believe that the geocentric model was incorrect, and that the Sun was in the centre of the Solar System.

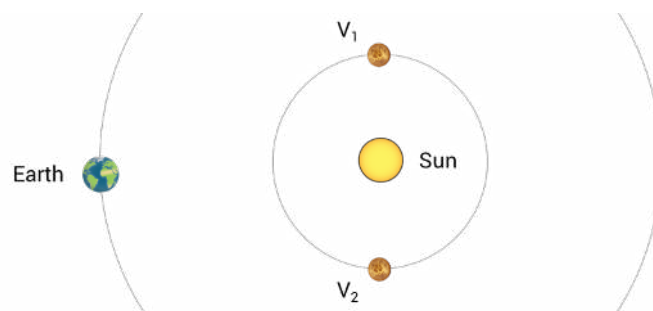


Because these moons were in orbit around Jupiter, it meant that something could be in orbit around another planet [1]. Therefore, not everything was in orbit about the Earth / the Earth could also have been in orbit about another object in the Solar System (such as the Sun) [1].

0	2	.	2
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The observation by Galileo of the phases of Venus lent further support to the heliocentric Copernican model.

The below diagram shows the orbits of Venus and the Earth around the Sun, and the positions of Venus at two different points in its orbit (V_1 and V_2). Note that the diagram is not to scale, and that the orbits of the other planets are not shown.



By shading the appropriate area(s) on the below circles, show how Venus would appear from Earth when at positions V_1 and V_2 in its orbit.



At V_1 (as viewed from the Earth) only the right-hand side of the visible face of Venus is illuminated by sunlight, so the left-hand side appears in darkness. The 9 o'clock and 3 o'clock phases (as shown above) would correspond to 'new Venus' and 'full Venus' phases!