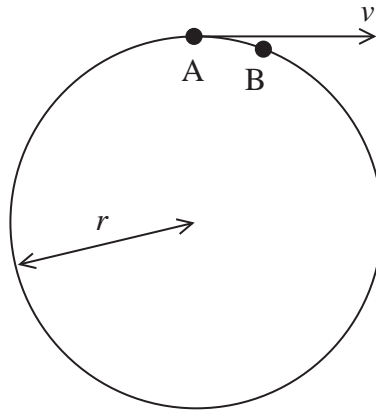


11 The International Space Station (ISS) orbits the Earth with a constant speed v . The orbit is circular and of radius r .

(a) The diagram represents two positions, A and B, of ISS during its orbit.



Draw a labelled vector diagram, in the space below, of the velocities at the two positions that shows the acceleration is directed towards the centre of the orbit.

(2)

(b) (i) The ISS completes one orbit in 92 minutes.

Calculate the centripetal acceleration of the ISS.

$$r = 6800 \text{ km}$$

(3)

Centripetal acceleration =

(ii) Astronauts in the ISS are often described as being “weightless”.

Discuss whether the astronauts are “weightless” when they are orbiting the Earth in the ISS.

(4)

(Total for Question 11 = 9 marks)