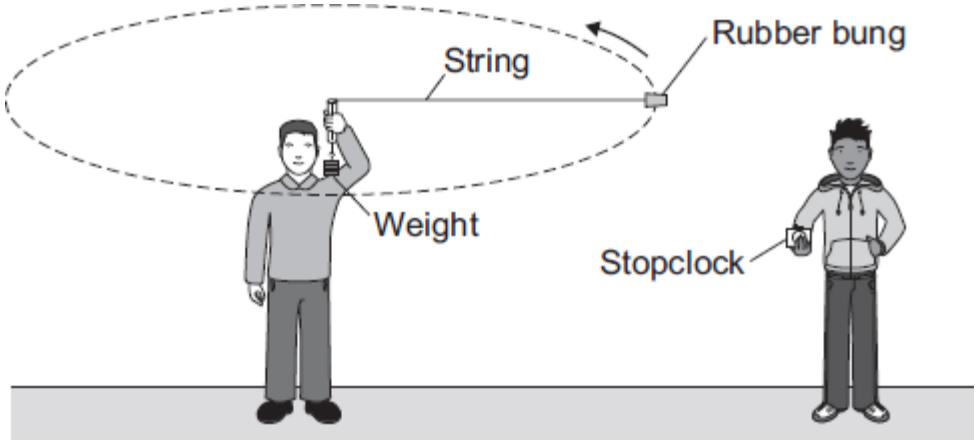
Name of the Student:_____
Max. Marks : 9 Marks **Time : 9 Minutes**

Q1.

Objects moving in a circle experience a force called **centripetal** force, which acts to the centre of the circle.

The diagram shows the apparatus used by two students to find out how the centripetal force acting on an object affects the speed of the object.



(a) (i) In which direction does the centripetal force act on the rubber bung?

_____

(1)

(ii) In this investigation, what provides the centripetal force?

_____

_____

(1)

(b) One student swung the rubber bung around in a circle at constant speed. The second student timed how long it took the rubber bung to complete 10 rotations. The students then calculated the speed of the rubber bung, using the radius of the circle and the time to complete one rotation. The students repeated this for several different values of centripetal force.

(i) During the investigation, the radius of the circle and the mass of the rubber bung were not changed.

Explain why.

_____

_____

_____

_____

(2)

(ii) One of the variables in this investigation was the time taken by the rubber bung to complete 10 rotations.

Which **two** words can be used to describe this variable?

Draw a ring around each of your **two** answers.

continuous **control** **dependent** **independent**

(1)

(iii) The students timed 10 rotations of the rubber bung, rather than just one rotation.

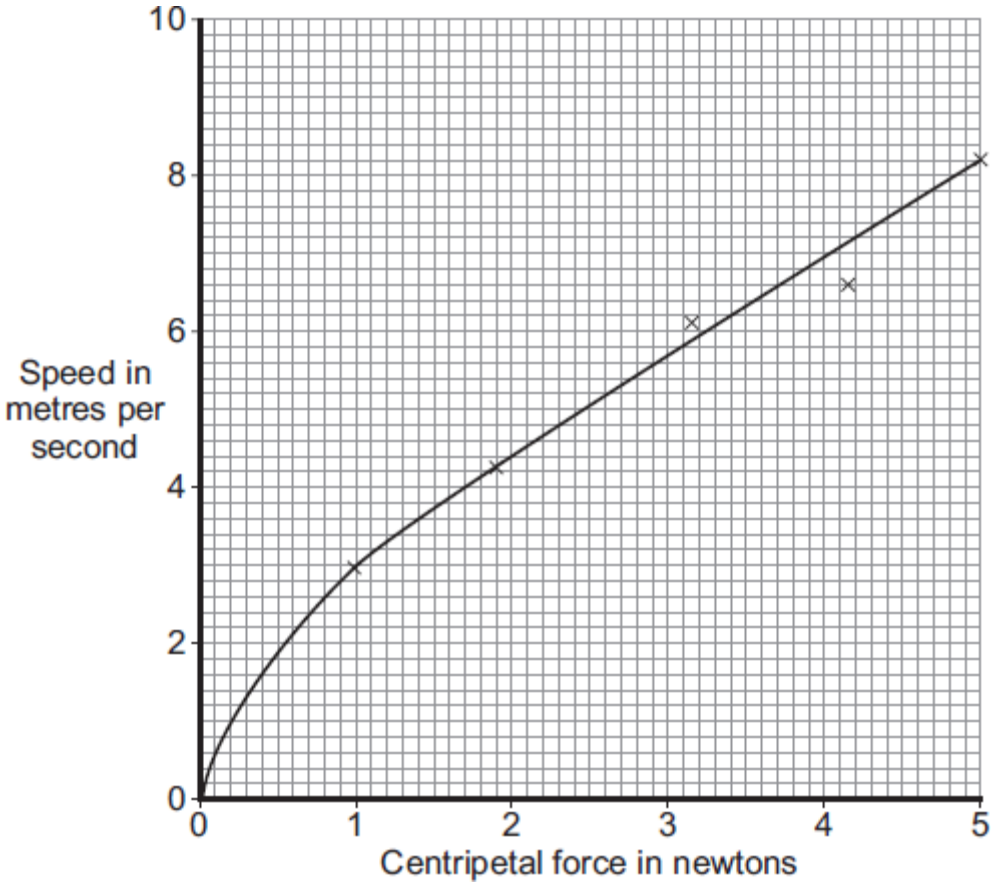
Suggest why.

_____

_____

(1)

(c) The graph shows the students' data.



There is a relationship between the speed of an object moving in a circle and the centripetal force acting on the object.

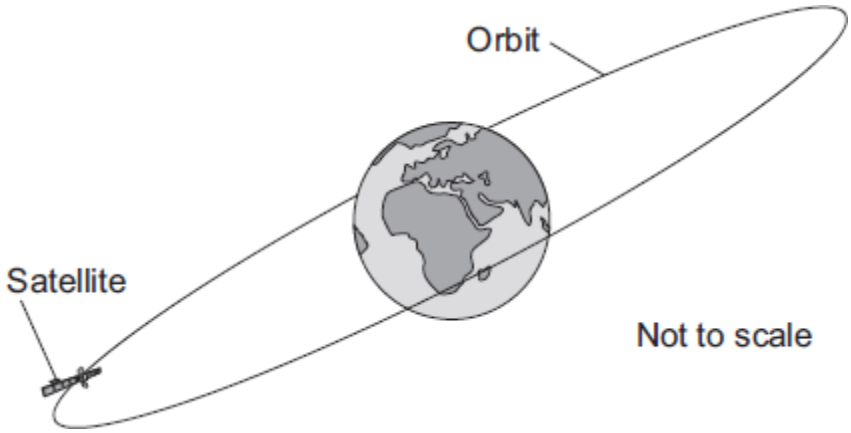
What conclusion about this relationship can the students make from their data?

_____

_____

(1)

(d) The diagram shows a satellite in a circular orbit above the Earth.
The satellite is part of the global positioning system (GPS).
The satellite orbits the Earth **twice** every 24 hours.



(i) What provides the centripetal force needed to keep the satellite in its orbit around the Earth?

_____

(1)

(ii) Is this satellite in a geostationary orbit?

Draw a ring around your answer. **Yes** **No**

Give a reason for your answer.

_____

_____

(1)

(Total 9 marks)