Question 16 **(12 marks)**

A ball is being swung around in a vertical circle on a string.

(a) In the table below, match the statements with A, B, C and/or D. (4 marks)

Statement	A, B, C and/or D
point(s) where the centripetal acceleration is the greatest	
point(s) where the tension in the string is the lowest	
point(s) where the net force is not toward the centre of the circle	
point(s) where the ball's weight force is perpendicular to the tension	

(b) Write an expression for the net force acting on the string at point C in terms of the weight force and the tension in the string. (1 mark)

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(c) Calculate how fast the 500 g ball can be moving at point A for the 1.20 m long string not to break, if the maximum tension it can withstand at point A is 172 N. (4 marks)

_____ m s^{-1}

(d) Calculate the maximum speed at which the ball can be moving at point C for the string not to break at point A. (3 marks)