3 Fig. 3.1 shows a toy aeroplane of mass 0.75 kg flying with a speed of 35 m s^{-1} in a horizontal circle at the end of a control wire that is 60 m long. The aeroplane generates a lift force *F* at an angle of 20° with the vertical towards the centre of the circular path. The control wire is constantly angled at 18° below the horizontal.

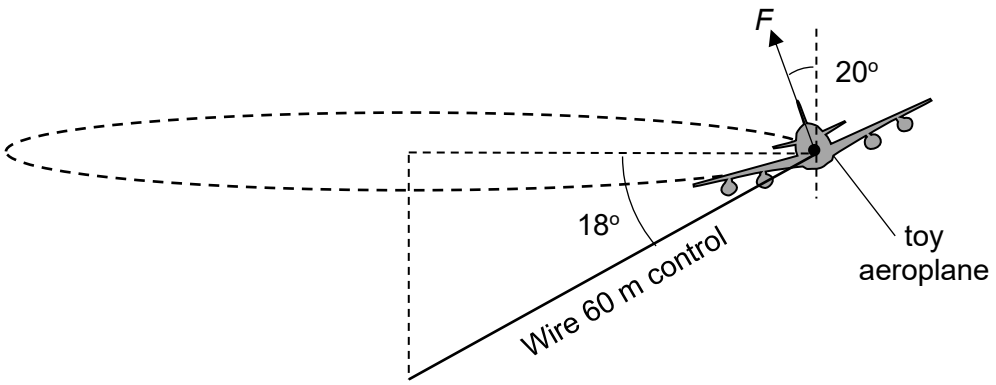

Fig. 3.1 (not to scale)

(a) Using Newton's laws of motion, explain why the toy aeroplane must experience a force towards the centre of its path.

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..... [2]

(b) In the space below, draw a labelled diagram showing the forces acting on the toy aeroplane.

……..[2]

(c) Calculate the tension in the control wire.

tension = …….. N [3]

[Total: 7]