2 Fig. 2.1 shows an airplane of mass m moving in a horizontal circular motion of radius 12 km and speed v. L is the lift force on the airplane and L makes an angle θ with the vertical.

The airplane completes one revolution in 250 s.

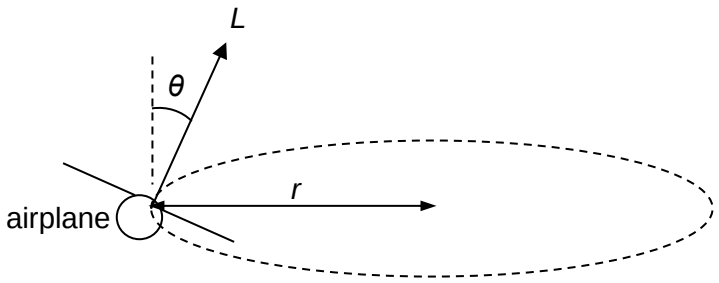

Fig. 2.1

(a) Explain why the wings of the airplane need to be tilted for it to move in a horizontal circle.

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…… [1]

(b) Calculate the speed v of the airplane.

v = …… m s^{-1} [2]

(c) Calculate the angle θ.

θ = …… ° [3]

(d) The wings are suddenly tilted for a larger angle θ.

State and explain one subsequent effect on the motion of the airplane.

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…… [2]