3 Fig. 3.1 shows an aircraft flying at constant speed in a horizontal circle of radius r. The weight of the aircraft is W and L is the lift force acting at right angles to the wings.
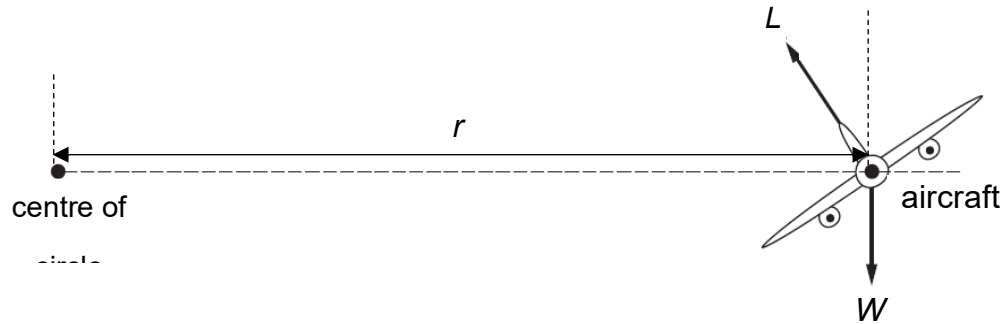

Fig. 3.1

(a) Explain how the lift force L maintains the aircraft flying in a horizontal circle.

....

....

[2]

....

....

(b) The weight W of the aircraft is 3.92×10^5 N. With the aircraft flying at a constant speed of 250 m s^{-1} in a horizontal circle, the lift force L acts at angle of 35° to the vertical.

(i) State the vertical component of L.

[1]

vertical component of L = …………....….………… N

(ii) Calculate L.

[2]

L = …………....….………… N

(iii) Calculate the radius r of the path of the aircraft's flight.

[3]

r = …………....….………… m