45. The free-body diagram (for the airplane of mass m) is shown below. We note that $\vec{F}_\ell$ is the force of aerodynamic lift and $\vec{a}$ points rightwards in the figure. We also note that $|\vec{a}| = v^2/R$ where $v = 480$ km/h $= 133$ m/s.

Applying Newton's law to the axes of the problem ($+x$ rightward and $+y$ upward) we obtain

$$\begin{aligned} \vec{F}_\ell \sin\theta &= m\frac{v^2}{R} \\ \vec{F}_\ell \cos\theta &= mg \end{aligned}$$

where $\theta = 40°$. Eliminating mass from these equations leads to

$$\tan\theta = \frac{v^2}{gR}$$

which yields $R = v^2/g\tan\theta = 2.2 \times 10^3$ m.