50. (a) The angle made by the cord with the vertical axis is given by $\theta = \cos^{-1}(18/30) = 53^\circ$. This means the radius of the plane's circular path is $r = 30 \sin\theta = 24$ m (we also could have arrived at this using the Pythagorean theorem). The speed of the plane is

$$v = \frac{4.4(2\pi r)}{1\,\text{min}} = \frac{8.8\pi(24\,\text{m})}{60\,\text{s}}$$

which yields $v = 11$ m/s. Eq. 6-17 then gives the acceleration (which at any instant is horizontally directed from the plane to the center of its circular path)

$$a = \frac{v^2}{r} = \frac{11^2}{24} = 5.1 \text{ m/s}^2 \ .$$

(b) The only horizontal force on the airplane is that component of tension, so Newton's second law gives

$$T \sin\theta = \frac{mv^2}{r} \quad \Longrightarrow \quad T = \frac{(0.75)(11)^2}{24 \sin 53^\circ}$$

which yields $T = 4.8$ N.

(c) The net vertical force on the airplane is zero (since its only acceleration is horizontal), so

$$F_{\text{lift}} = T\cos\theta + mg = 4.8\cos 53^\circ + (0.75)(9.8) = 10 \text{ N} \ .$$