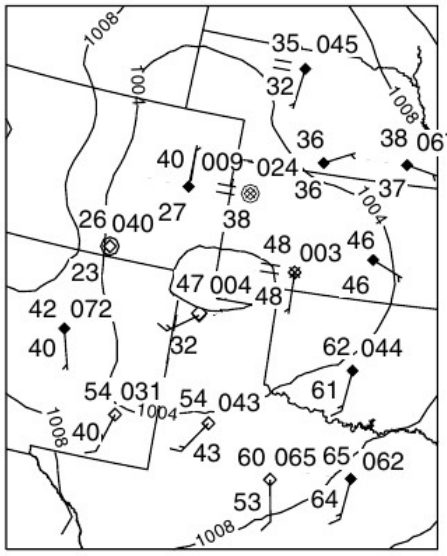

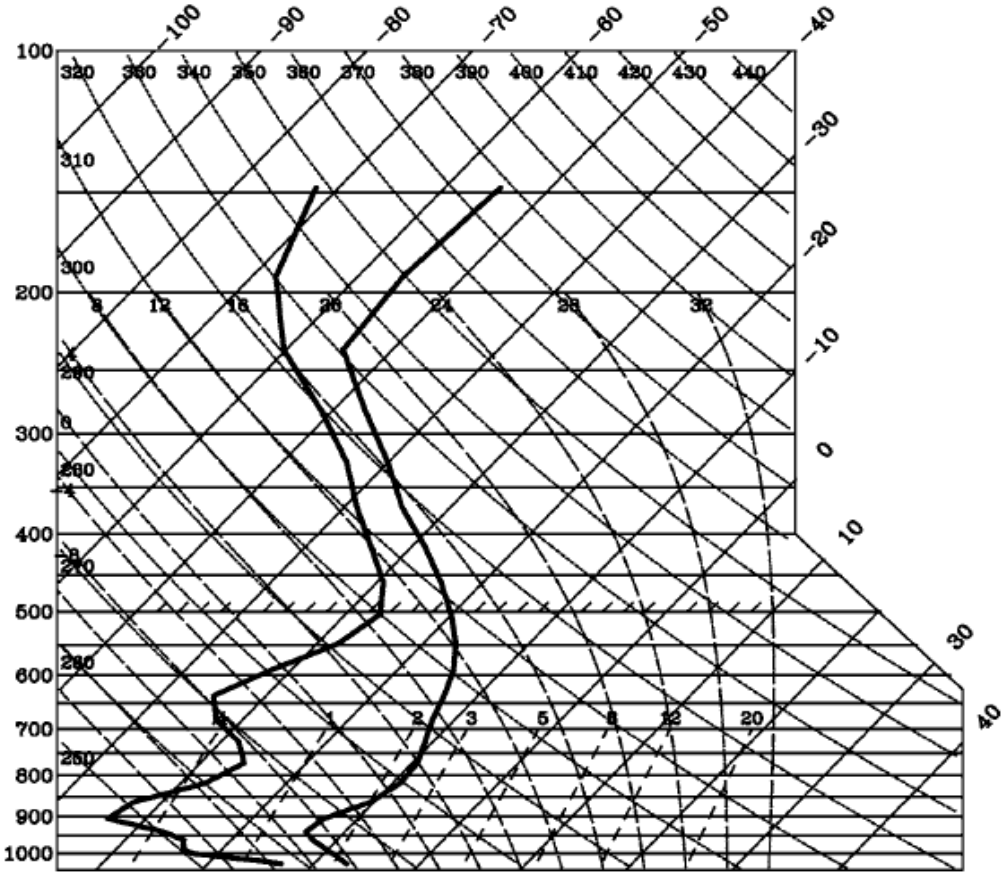

Figure 4.4 'Skew *T*' atmospheric sounding from 00 UTC 16 Feb 2003 at Upton, NY showing temperature (right curve) and dew point temperature (left curve) expressed in °C against pressure (hPa). On this diagram pressure is indicated by the vertical scale on the left side of the diagram. Lines of constant temperature are 'skewed' and slope from the lower left to the upper right and are labeled along the top and right sides of the diagram

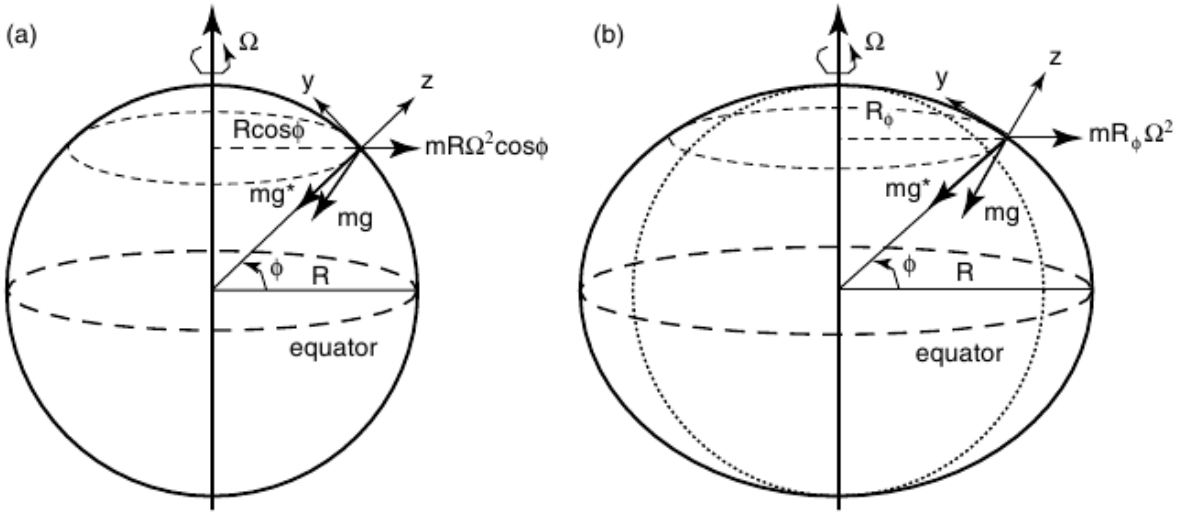

Figure 4.6 Centrifugal and gravitational forces acting on an object of mass m at rest at latitude ϕ on (a) a perfectly spherical Earth and (b) the actual Earth (not to scale). Note that the centrifugal force is in fact almost three orders of magnitude smaller than the gravitational force

$$
\begin{aligned}
\frac{Du}{Dt} &= -\frac{1}{\rho}\frac{\partial p}{\partial x} + \nu\left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2}\right) + (2\Omega v \sin\phi - 2\Omega w \cos\phi) \\
\frac{Dv}{Dt} &= -\frac{1}{\rho}\frac{\partial p}{\partial y} + \nu\left(\frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2} + \frac{\partial^2 v}{\partial z^2}\right) - (2\Omega u \sin\phi) \qquad (4.19) \\
\frac{Dw}{Dt} &= -g - \frac{1}{\rho}\frac{\partial p}{\partial z} + \nu\left(\frac{\partial^2 w}{\partial x^2} + \frac{\partial^2 w}{\partial y^2} + \frac{\partial^2 w}{\partial z^2}\right) + (2\Omega u \cos\phi)
\end{aligned}
$$

acceleration of air parcel

gravity

pressure gradient force

viscous force

Coriolis force