51. (a) The centripetal force is given by Eq. 6-18:

$$F = \frac{mv^2}{R} = \frac{(1)(465)^2}{6.4 \times 10^6} = 0.034 \text{ N} .$$

(b) Calling downward (towards the center of Earth) the positive direction, Newton's second law leads to

$$mg - T = ma$$

where $mg = 9.80$ N and $ma = 0.034$ N, calculated in part (a). Thus, the tension in the cord by which the body hangs from the balance is $T = 9.80 - 0.03 = 9.77$ N. Thus, this is the reading for a standard kilogram mass, of the scale at the equator of the spinning Earth.