

53. (a) Using Eq. 32-11, we find  $\mu_{\text{orb},z} = -3\mu_B = -2.78 \times 10^{-23} \text{ J/T}$  (that these are acceptable units for magnetic moment is seen from Eq. 32-12 or Eq. 32-7; they are equivalent to  $\text{A}\cdot\text{m}^2$ ).
- (b) Similarly, for  $m_\ell = -4$  we obtain  $\mu_{\text{orb},z} = 3.71 \times 10^{-23} \text{ J/T}$ .