

73. (a) With  $v_0 = 0$ , Eq. 2-16 leads to

$$a = \frac{v^2}{2\Delta x} = \frac{(6.0 \times 10^6 \text{ m/s})^2}{2(0.015 \text{ m})}$$

which yields  $1.2 \times 10^{15} \text{ m/s}^2$  for the acceleration. The force responsible for producing this acceleration is

$$F = ma = (9.11 \times 10^{-31} \text{ kg}) (1.2 \times 10^{15} \text{ m/s}^2) = 1.1 \times 10^{-15} \text{ N} .$$

(b) The weight is  $mg = 8.9 \times 10^{-30} \text{ N}$ , many orders of magnitude smaller than the result of part (a). As a result, gravity plays a negligible role in most atomic and subatomic processes.