

58. (a) The speed of v of the mass m after it has descended $d = 50$ cm is given by $v^2 = 2ad$ (Eq. 2-16) where a is calculated as in Sample Problem 11-7 except that here we choose $+y$ downward (so $a > 0$). Thus, using $g = 980$ cm/s², we have

$$v = \sqrt{2ad} = \sqrt{\frac{2(2mg)d}{M + 2m}} = \sqrt{\frac{4(50)(980)(50)}{400 + 2(50)}} = 1.4 \times 10^2 \text{ cm/s} .$$

- (b) The answer is still 1.4×10^2 cm/s = 1.4 m/s, since it is independent of R .