Ch. 10 ws 2

(#7) ~~$\frac{1}{2}mv_i^2 + mgh_i = \frac{1}{2}mv_f^2 + mgh_f$~~ $v_i = 0\,m/s$, $h_f = 0\,m$

$v_f = \sqrt{2gh_i}$

$= \sqrt{2(9.80)(3.00)}$

$= 7.67\,m/s$

(#8) $\frac{1}{2}mv_i^2 + mgh_i = \frac{1}{2}mv_f^2 + mgh_f$

$v_i = 18.0\,m/s$

$h_i = 5.40\,m$

$v_f^2 = v_i^2 + 2gh_i$

$v_f = \sqrt{v_i^2 + 2gh_i}$

$= \sqrt{18.0^2 + 2(9.8)(5.40)}$

$= 20.7\,m/s$

(#9) $F_g = 755N$

$h_i = 10.0m$

$h_f = 5.00m$

$v_i = 0\,m/s$

a)

$\frac{1}{2}mv_i^2 + mgh_i = \frac{1}{2}mv_f^2 + mgh_f$

$v_f^2 = 2g(h_i - h_f)$

$= \sqrt{2(9.80)(10.0-5.00)}$

$= 9.90\,m/s$

b) $h_f = 0$

$v_f^2 = 2g(h_i - h_f)$

$= \sqrt{2(9.80)(10.0-0.0)}$

$= 14.0\,m/s$

(#16) ~~$\frac{1}{2}mv_i^2 + mgh_i = \frac{1}{2}mv_f^2 + mgh_f$~~

$v_i = 0\,m/s$

$v_f = 12.0\,m/s$

$h_f = 0m$

$m = 50.0kg$

$h_i = \frac{v_f^2}{2g}$

$= \frac{(12.0)^2}{2(9.80)}$

$= 7.35m$

(#18) $F = 201\,N$

$d = 1.3m$

$m = .30kg$

$v_i = 0\,m/s$

a) $Fd = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$

$v_f = \sqrt{\frac{2Fd}{m}}$

$= \sqrt{\frac{2(201)(1.3)}{.30}}$

$= 41.7\,m/s$

$\Sigma F = 198\,N$

b)

$Fd\cos\theta = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$

$\frac{1}{2}mv_f^2 = Fd\cos\theta + \frac{1}{2}mv_i^2$

$= (198)(1.3)(1) + \frac{1}{2}(.30)(0)^2$

$= 257.4\,J$

$\frac{1}{2}mv_i^2 + mgh_i = \frac{1}{2}mv_f^2 + mgh_f$

$257.4 = mgh_f$

$h_f = \frac{257.4}{mg}$

$= \frac{257.4}{(.30)(9.80)}$

$= 87.6\,m$