

91. (a) The initial kinetic energy is $K_i = \frac{1}{2}(1.5)(3)^2 = 6.75 \text{ J}$.
- (b) The work of gravity is the negative of its change in potential energy. At the highest point, all of K_i has converted into U (if we neglect air friction) so we conclude the work of gravity is -6.75 J .
- (c) And we conclude that $\Delta U = 6.75 \text{ J}$.
- (d) The potential energy there is $U_f = U_i + \Delta U = 6.75 \text{ J}$.
- (e) If $U_f = 0$, then $U_i = U_f - \Delta U = -6.75 \text{ J}$.
- (f) Since $mg\Delta y = \Delta U$, we obtain $\Delta y = 0.46 \text{ m}$.