88. (a) The initial kinetic energy is $K_i = \frac{1}{2}(1.5)(20)^2 = 300\,\text{J}$.

(b) At the point of maximum height, the vertical component of velocity vanishes but the horizontal component remains what it was when it was "shot" (if we neglect air friction). Its kinetic energy at that moment is

$$K = \frac{1}{2}(1.5)\left(20\cos 34^\circ\right)^2 = 206\ \text{J}\ .$$

Thus, $\Delta U = K_i - K = 300 - 206 = 94$ J.

(c) Since $\Delta U = mg\Delta y$, we obtain

$$\Delta y = \frac{94\,\text{J}}{(1.5\,\text{kg})\,(9.8\,\text{m/s}^2)} = 6.4\ \text{m}\ .$$