18. We use d to denote the magnitude of the spelunker's displacement during each stage. The mass of the spelunker is $m = 80.0$ kg. The work done by the lifting force is denoted W_i where $i = 1, 2, 3$ for the three stages. We apply the work-energy theorem, Eq. 17-15.

(a) For stage 1, $W_1 - mgd = \Delta K_1 = \frac{1}{2}mv_1^2$, where $v_1 = 5.00\,\text{m/s}$. This gives

$$W_1 = mgd + \frac{1}{2}mv_1^2 = (80.0)(9.8)(10.0) + \frac{1}{2}(80.0)(5.00)^2 = 8.84 \times 10^3\,\text{J} .$$

(b) For stage 2, $W_2 - mgd = \Delta K_2 = 0$, which leads to

$$W_2 = mgd = (80.0\,\text{kg})\left(9.8\,\text{m/s}^2\right)(10.0\,\text{m}) = 7.84 \times 10^3\,\text{J} .$$

(c) For stage 3, $W_3 - mgd = \Delta K_3 = -\frac{1}{2}mv_1^2$. We obtain

$$W_3 = mgd - \frac{1}{2}mv_1^2 = (80.0)(9.8)(10.0) - \frac{1}{2}(80.0)(5.00)^2 = 6.84 \times 10^3\ \text{J} .$$