1- A 50-N force is the only force on a 2.0-kg box that starts from rest. Calculate the rate at which the force is doing work (the power) at the instant the particle has gone 3.0 m.

\[ P = F \cdot \Delta v \]
\[ = 50 \times 12.2 \]
\[ = 610 \text{ W} \]

\[ F = ma \]
\[ a = \frac{F}{m} = \frac{50}{2} = 25 \frac{m}{s^2} \]

\[ \frac{v_f - v_i}{\Delta x} = 2a \]
\[ \frac{v_f - 0}{2 \times 3} = 2 \times 25 \]
\[ v_f = \sqrt{2(15)(3)} \]
\[ = 12.2 \text{ m/s} \]

2- As a particle (of mass 1 kg) moves from point A to point B only two forces act on it: one force does -30 J work, while the other force does +50 J work. **Calculate** the final speed of the particle at point B, if it starts from rest at point A.

\[ W_{net} = D K \]
\[ +50 - 30 = \frac{1}{2} m (v_f^2 - v_i^2) \]

\[ v_f = \sqrt{2(20)} = 6.3 \text{ m/s} \]