

23.4

This is a fairly simple integration it seems;

$$\int_0^{100} 2 \frac{\text{kilograms}}{\text{meter}} \cdot \Delta x \cdot 9.8 \text{ ms}^{-2} \int \Delta x$$

$$\left[2 \frac{\text{kg}}{\text{m}} \cdot \frac{1}{2} \Delta x^2 \cdot 9.8 \text{ ms}^{-2} \right]_0^{100}$$

$$\frac{\text{kg}}{\text{m}} \cdot (100 \text{ m})^2 \cdot 9.8 \text{ ms}^{-2}$$

$$10000 \cdot 9.8 \text{ m}^2 \text{ kg s}^{-2}$$

$$98000 \text{ J}$$