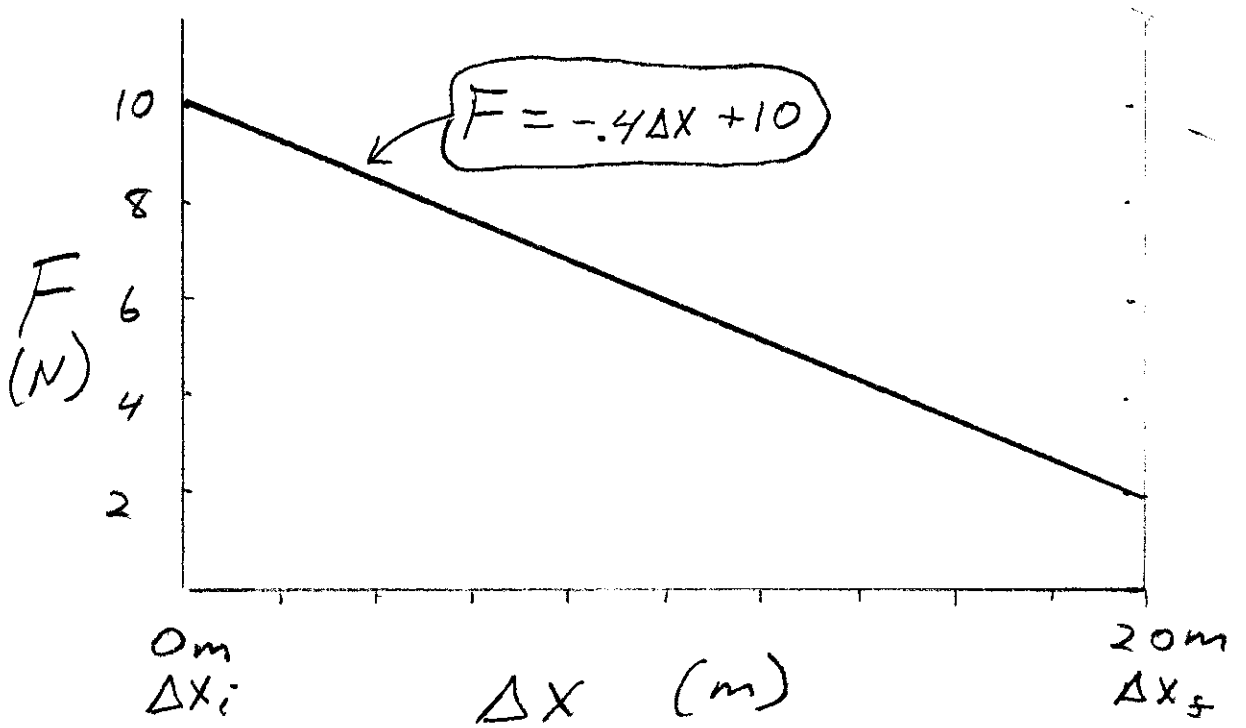
200603161032

Work = Area under a curve




$$W = \int dW$$

$$= \int_{\Delta X=0}^{\Delta X=20} F\, d\Delta x$$

$$W = \int_{\Delta X=0}^{\Delta X=20} S(\Delta X)\, d\Delta X \quad \text{let } \Delta X = S$$

$$= \int_0^{20} (-.4S + 10)\, dS$$

$$= \int_0^{20} -.4S\, dS + \int_0^{20} 10\, dS$$

$$= -\frac{.4S^2}{2} + 10S \Big|_0^{20}$$

$$= \left(\frac{-.4(20)^2}{2} + 10(20)\right) - \left(\frac{4(0)^2}{2} + 10(0)\right)$$

$$= -80 + 200 - 0$$

$$W = 120 \text{ Joules}$$