

$$\begin{aligned} 22 &= f(x) = kx = k(0.18) \quad [18 \text{ cm} = 0.18 \text{ m}], \text{ so} \\ k &= 1100/9 \text{ N/m and } f(x) = \frac{1100}{9}x. \text{ Now } 9 \text{ cm} = 0.09 \text{ m, so} \\ W &= \int_0^{0.09} \frac{1100}{9}x \, dx = \left[\frac{550}{9}x^2 \right]_0^{0.09} \\ &= \frac{550}{9}(0.0081) = 99/200 \approx 0.50 \text{ J.} \end{aligned}$$