

Atkins 3.2 (2)

Find the work done in stretching a spring, if it obeys
hook's law

$$f = c(L - L_0)$$

$$W = \int_{L_1}^{L_2} f \, dL$$

$$= \left(\frac{cL^2}{2} - cL_0L \right) \Big|_{L_1}^{L_2}$$

$$= \frac{cL_2^2}{2} - cL_0L_2 - \frac{cL_1^2}{2} + cL_0L_1$$

$$= \frac{1}{2} c [L_2^2 - 2L_2L_0 - L_1^2 + 2L_0L_1]$$

$$W = \frac{1}{2} c [(L_2 - L_1)(L_2 - 2L_0 + L_1)]$$

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