

SUBJECT WORK BY A SPRING

DEPARTMENT _____

PROJECT _____

DRAWING REF. _____

PREPARED BY P. COPPOLI

$$W_{\text{SPRING}} = \int_{x_i}^{x_f} Kx dx$$

GIVEN:

$$x_{\text{FREE}} = 0.30 \text{ m}$$

SET FREE
LENGTH AS $x=0$

$$x_0 = 0$$

$$x_1 = 0.42 \text{ m}$$

$$x_1 = .12$$

$$W_1 = 2 \text{ J}$$

$$x_2 = 0.35 \text{ m}$$

$$x_2 = .05$$

$$x_3 = 0.40 \text{ m}$$

$$x_3 = .10$$

FIND:

① K

② W_{2-3}

$$(1) W_1 = 2 \text{ J} = \frac{Kx^2}{2} \Big|_0^{.12} = \frac{K(.0144)}{2} = 2 \rightarrow \underline{K = 277.778}$$

$$(2) W_{2-3} = \int_{.05}^{.1} Kx dx \rightarrow \frac{1}{2} Kx^2 \Big|_{.05}^{.1} \rightarrow \frac{1}{2}(277.778)(.05)^2 - \frac{1}{2}(277.778)(.1)^2$$

$$W_{2-3} = 0.347 - 1.389 = \underline{-1.041 \text{ J}} \text{ OR } \underline{1.041 \text{ J}}$$

DEPENDENT ON DEFINITION
OF \pm .