

201 SG.4 #8 correction

Units are wrong in the original.

$$1 \text{ N} = 1 \frac{\text{kg} \cdot \text{m}}{\text{s}^2}$$

$$20 \text{ cm} \longrightarrow x = 0 \text{ \& } 20 \text{ cm} = .2 \text{ m}$$

$$25 \text{ cm} = (25 \text{ cm}) \left(\frac{1 \text{ m}}{100 \text{ cm}} \right) = \frac{25}{100} \text{ m} = .25 \text{ m}$$

$$\text{So } x = .25 - .2 = .05 \text{ m} \longleftrightarrow 25 \text{ cm}$$

$$30 \text{ cm} = .3 \text{ m} \text{ corresponds to}$$

$$x = .3 - .2 = .1 \text{ m}, \text{ which was correct}$$

on the solutions.

But the work done in stretching the spring

from 20 cm to 25 cm corresponds to

stretching it from $x = 0$ to $x = .05$

$$\text{This gives } \int_0^{.05} 250x \, dx = 250 \left[\frac{1}{2} x^2 \right]_0^{.05}$$

$$= 125 \left[(.05)^2 - 0^2 \right] = 125 \left[.0025 \right] = .3125 \text{ N}\cdot\text{m}$$

$= .3125 \text{ J}$