(a) If $\int_0^{0.21} kx\,dx = 6$ J, then $6 = \left[\frac{1}{2}kx^2\right]_0^{0.21} = \frac{1}{2}k(0.0441)$
$= 0.02205k$ and $k = \frac{6}{0.02205} = \frac{40000}{147} \approx 272.11$ N/ m. Thus, the work needed to stretch the spring from 29 cm to 37 cm is

$$\int_{0.05}^{0.13} \frac{40000}{147}x\,dx = \left[\frac{20000}{147}x^2\right]_{0.05}^{0.13} = \frac{20000}{147}\left(\frac{169}{10000} - \frac{1}{400}\right)$$
$$= \frac{96}{49} \approx 1.96 \text{ J.}$$

(b) $f(x) = kx$, so $10 = \frac{40000}{147}x$ and $x = \frac{147}{4000}$ m $= 3.7$ cm