Show that the length of the perimeter of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1, a > b$ is $4aE(e)$ where $E(k) = \int_0^{\frac{\pi}{2}} \sqrt{1 - k^2 \cos^2 \theta}\, d\theta$ is the elliptic integral of the second kind and $e = \sqrt{1 - \frac{b^2}{a^2}}$ is the eccentricity of the ellipse.