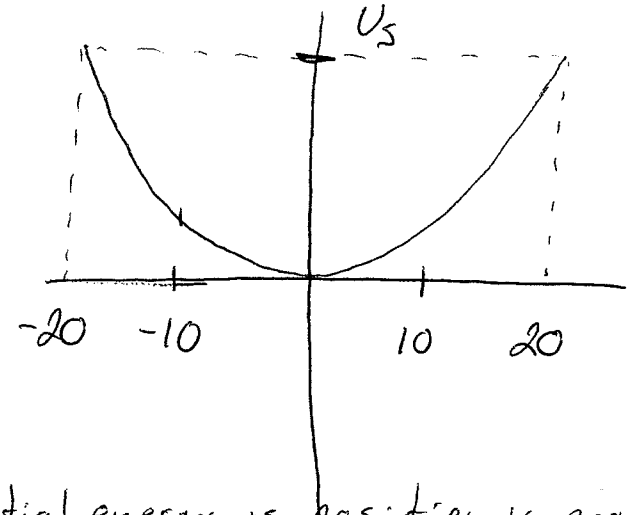
A block of mass m is attached to a spring and allowed to oscillate



$U_S = 2.0\,J$

$m = 2.0\,kg$

A plot of potential energy vs position is provided above for the object.

a) If $V_{max} = 0.85\,m/s$ will it reach $x = 0.15\,m$?

b) If so how fast is it traveling, if not where is it when velocity is maximum?

$$V_{max} = \pm \omega x_m$$

$$U(t) = \frac{1}{2} k \left(x(t)\right)^2$$

$$2.0\,J = \frac{1}{2} k \left(.20\,m\right)^2$$

$$\frac{2\left(2.0\,J\right)}{\left(.20\,m\right)^2} = k = 100\,\frac{N}{m}$$

$$\omega = \sqrt{\frac{k}{m}} = \sqrt{\frac{100\,N/m}{2.0\,kg}} = 7.07\,rad/s$$

$$x_m = \frac{V_{max}}{\omega} = \frac{0.85\,m/s}{7.07\,rad/s} = \boxed{0.120\,m}$$

Does Not reach 0.15m