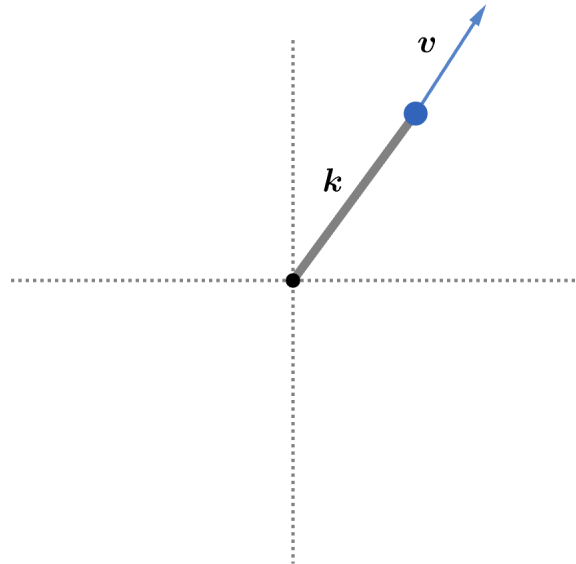


2011 F=ma Exam: Problem 19

Kevin S. Huang



Since $\vec{r} = x\vec{i} + y\vec{j}$, we have $\vec{F} = -k\vec{r}$ so we can identify the spring constant as $k = 8 \text{ N/m}$. The period of a mass-spring system is given by

$$T = 2\pi\sqrt{\frac{m}{k}}$$

The particle first returns to the origin in half the period,

$$\frac{T}{2} = \pi\sqrt{\frac{m}{k}} = \pi\sqrt{\frac{2 \text{ kg}}{8 \text{ N/m}}} = 1.57 \text{ s}$$

so the answer is C.