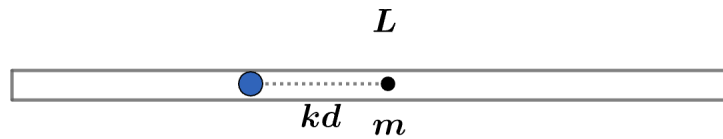# 2007 F=ma Exam: Problem 33

Kevin S. Huang

From the previous problem, we have

$$\beta = \sqrt{\frac{k}{1+k^2}}$$

To maximize β, we can equivalently minimize $1/\beta^2$:

$$\frac{1}{\beta^2} = \frac{1+k^2}{k} = k + \frac{1}{k}$$

which occurs at $k = 1$. Thus,

$$\beta_{\max} = \sqrt{\frac{1}{1+1^2}} = \frac{1}{\sqrt{2}}$$

so the answer is $\boxed{\text{C}}$.