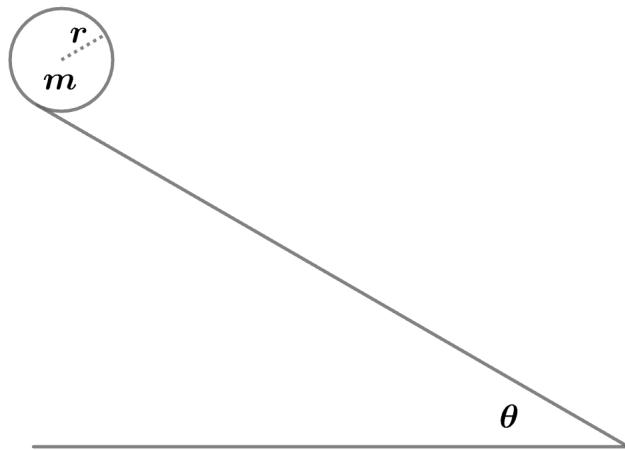


2017 F=ma Exam: Problem 15

Kevin S. Huang

$$I = \beta mr^2$$



Recall the acceleration of an object rolling without slipping down an incline of angle θ is given by

$$a = \frac{g \sin \theta}{1 + \beta}$$

where the object has moment of inertia $I = \beta mr^2$. Since all four objects are solid spheres, they have the same $\beta = 2/5$ and hence same acceleration. If they move through the same distance, they will all have the same speed. Thus, the answer is E.