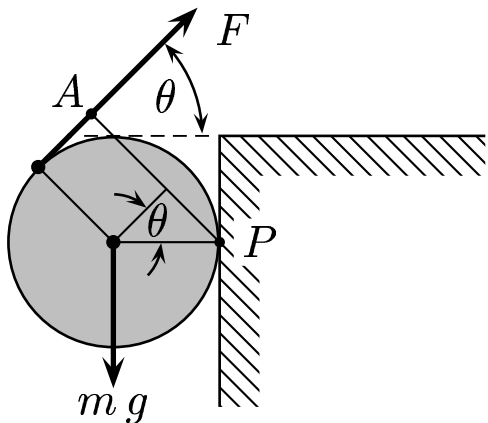


Consider a solid sphere of radius  $R$  and mass  $m$  is held against a wall by a string being pulled at an angle  $\theta$ .

Determine the torque equation about the point P.

- A)  $R m g = R F$ .
- B)  $R m g = R F (1 + \sin \theta)$ .
- C)  $R m g = R F (1 + \cos \theta)$ .
- D)  $R m g = 2 R F \sin \theta$ .
- E)  $R m g = 2 R F \cos \theta$ .



About P, the clockwise torque is,

$$\tau_{cw} = \overline{AP} \times F,$$

where  $\overline{AP} = R(1 + \sin \theta)$  and the clockwise torque,

$$\tau_{ccw} = R m g.$$

So the equation is,  $\tau_{ccw} = \tau_{cw}$ , gives  $R m g = R F (1 + \sin \theta)$ .  
 Answer **B**.