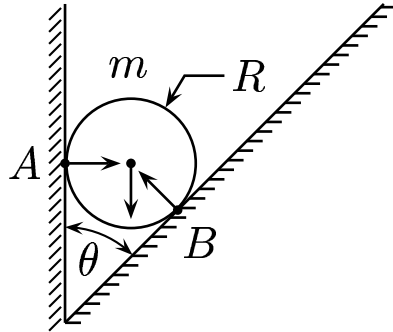


Consider a solid sphere of radius R and mass m placed in a wedge, where one wall is vertical and the other wall has an angle θ with respect to the vertical wall. The walls are smooth. Sketch a free body diagram for the ball, which involves F_A and F_B , the forces acting on the contact points A and B respectively and the weight mg .



Choose the appropriate expression below.

- A) $mg = F_A \sin \theta$.
- B) $mg = F_A \cos \theta$.
- C) $mg = F_A \tan \theta$.

$$\sum F_x : \quad F_A - F_B \cos \theta = 0$$

$$\sum F_y : \quad m g - F_B \sin \theta = 0$$

$$F_B = \frac{m g}{\sin \theta}$$

$$F_A = m g \frac{\cos \theta}{\sin \theta} = \frac{m g}{\tan \theta}.$$

Answer **C**.

12.03-05 Solid Sphere within a Wedge 2004-4-6