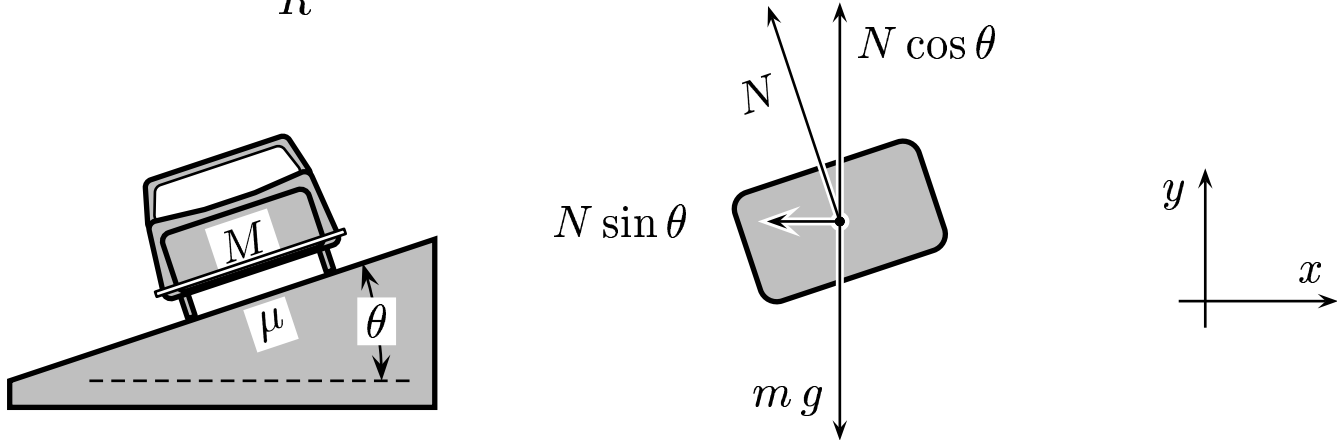


A car travels along a slippery curve. The radius of curvature of the road is R . The banking angle is θ . The speed of the car is at its critical speed so that the frictional force is 0. Let x be in the horizontal plane, y be vertical, and let $F_c = m \frac{v^2}{R}$ be the centripetal acceleration.



Choose the correct pair of relations below.

- A) $N_x = N \sin \theta = F_c$ and $N_y = N \sin \theta = m g$.
 B) $N_x = N \cos \theta = F_c$ and $N_y = N \cos \theta = m g$.
 C) $N_x = N \sin \theta = F_c$ and $N_y = N \cos \theta = m g$.
 D) $N_x = N \cos \theta = F_c$ and $N_y = N \sin \theta = m g$.

Using the free-body diagram, the $F = m a$ equation in the horizontal direction is

$$N \sin \theta + f \cos \theta = m \frac{v^2}{R^2},$$

where the frictional force $f = 0$.

By inspection,

Answer **C**.