Answer on Question #39374, Physics, Mechanics

Question:

motorcycle is going along are banked road and he has to line, inwards making an angle of 21°49' with the vertical in order to keep his balance if path length is 1 km long find the speed of the cyclist?

Answer:

Newton's second law of motion:

$$OX: \quad \frac{mv^2}{r} = N \sin \alpha$$

$$OY: \quad mg = N \cos \alpha$$

where $\frac{v^2}{r}$ is centripetal acceleration.

Therefore:

$$\frac{v^2}{r} = g \tan \alpha$$

Therefore, speed of motion equals:

$$v = \sqrt{gr \ \tan \alpha} = 62.7 \frac{m}{s}$$

Answer: $62.7 \frac{m}{s}$