Answer on Question#38461 – Physics - Mechanics

A cyclist is riding on a road, at a uniform speed of 5 m/s for 2 hours. What is his acceleration?

Solution:

$v = 5\frac{m}{s} - uniform\ speed\ of\ the\ cyclist.$

$t = 2\ hour = 7200s - time.$

Travelled distance:

$S = v \cdot t = 2\pi R$

$R = \frac{vt}{2\pi}$ (1)

From the definition of the centripetal acceleration, thus:

$a_c = \frac{v^2}{R} = \frac{2\pi v^2}{vt} = \frac{2\pi v}{t} = \frac{2\pi \cdot 5\frac{m}{s}}{7200s} = 0.004\frac{m}{s^2}$

Answer: centripetal acceleration is equal to $0.004\frac{m}{s^2}$.