Answer on Question 49853, Physics, Mechanics | Kinematics | Dynamics

Question:

A toy car of mass $10kg$ is driving around a circle of radius $50cm$ with a centripetal acceleration of $8\frac{m}{s^2}$. What is the speed of the car?

Solution:

By the definition of the centripetal acceleration we have:

$$a_c = \frac{v^2}{R},$$

where a_c is the centripetal acceleration of the car, v is the speed of the car, R is the radius of the circle.

From this formula we can obtain the speed of the car:

$$v = \sqrt{a_c R} = \sqrt{8\frac{m}{s^2} \cdot 0.5m} = 2\frac{m}{s}.$$

Answer:

The speed of the car is $v = 2\frac{m}{s}$.