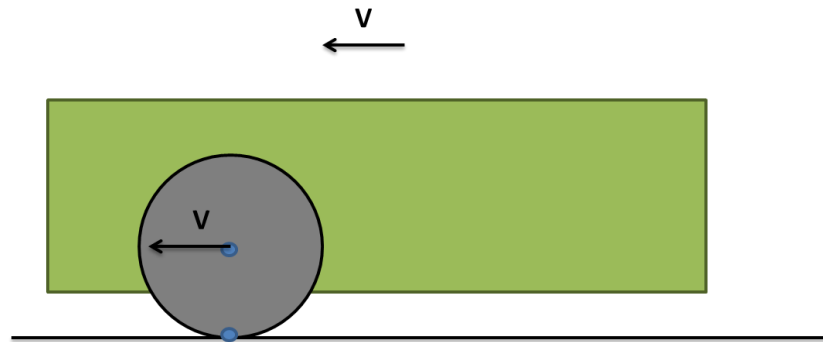# Answer on Question #43250, Physics, Mechanics | Kinematics | Dynamics

A car with 60 cm diameter tires is traveling at a constant speed of 100 km/hr. What is the angular velocity of the tires in rad/s?

Solution.

When the car is moving, velocity of bottom point of its tires is equal to zero. But the center of the wheel is moving with the same velocity as a car:

Let's move to the frame of reference, associated with the car. In this frame of reference car is in the state of rest and the bottom point of tires moves with velocity **V** to the opposite direction:
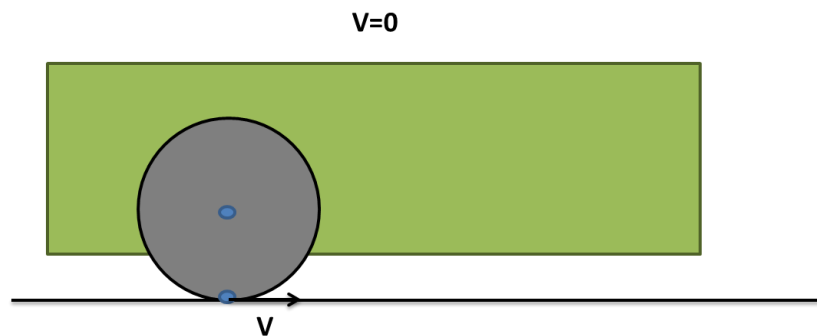
So now we can determine our angular velocity. By definition:

$$\omega = \frac{V}{R}$$

Numerically:

$$\omega = \frac{100 \cdot \frac{1000m}{3600s}}{0.6m} \approx 46.3 \frac{rad}{s}$$

Answer: $\omega \approx 46.3 \frac{rad}{s}$