

Answer on Question 55317, Physics, Mechanics | Kinematics | Dynamics

Question:

A string is wound around a wheel of radius 20cm . How large is the angle through which the wheel must turn to unwind 30cm of the string?

Solution:

We can find the angle θ through which the wheel must turn to unwind 30cm of the string from the relation between linear and angular variables:

$$s = \theta r,$$

here, s is the length of the string unwound, r is the radius of the wheel.

From this formula we can find the angle θ :

$$\theta = \frac{s}{r} = \frac{0.3\text{m}}{0.2\text{m}} = 1.5\text{rad}.$$

Answer:

$$\theta = 1.5\text{rad}.$$