

Rotational Kinematics

Names:

Cauchy and Lagrange are playing with a hoop. They're rolling it on the ground – no mean feat since they're both about 5-cm tall. But they're managing and it's adorable. Lagrange notes that the hoop slows down as it rolls up the slight slope of our driveway. Cauchy, being a clever pig, resolves to do some physics.

1. The hoop has a radius of 40 cm and an initial velocity of 2 m/s. What's its angular velocity?

Principle(s):

Equation(s):

2. The hoop is accelerating at -1 m/s^2 . What's the angular acceleration?

Principle(s):

Equation(s):

3. How long before the hoop comes to a stop?

Principle(s):

Equation(s):

4. How many radians will it turn in that time? How many revolutions?

Principle(s):

Equation(s):

5. **Stretch:** How far will it travel linearly?

Principle(s):

Equation(s):

6. **Stretch:** Work out how far it'll travel from linear kinematics and compare the two results.

Principle(s):

Equation(s):