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):**