Problem 1

**Given:**

Mass M = 2.50 +/- 0.020 kg

Radius R = 0.180 +/- 0.0030 m

Angular velocity ω = 17.5 +/- 0.250 rad/s

**Find:**

Angular momentum of a uniform disk with the given measurements

**Diagram:**

N/A

**Theory:**

Angular momentum L =

**Assumptions:**

The three original uncertainties are uncorrelated and random.

**Solution:**

**Diagram

Description automatically generated**

Problem 2

**Given:**

Length L = 0.75 +/- 0.011 m

**Find:**

The period of the pendulum T

**Diagram:**

N/A

**Theory:**

**Assumptions:**

None

**Solution:**

A picture containing text, whiteboard

Description automatically generated

The predicted value of T is seconds. A measured value of seconds is consistent with the theoretical prediction because it is only very slightly different and within the margin of error.

Problem 3

**Given:**

m/s

m/s

s

**Find:**

The acceleration and uncertainty measurement of a ball rolling down a ramp with the given velocity and time data.

**Diagram:**

**A picture containing text, indoor, tiled, dirty

Description automatically generated**

**Theory:**

**Assumptions:**

All uncertainties are independent and random.

**Solution:**

**A picture containing text, white, close

Description automatically generated**

**A picture containing text, whiteboard

Description automatically generated**

The acceleration is

The other calculated acceleration of does not agree with the prediction because it is not within the margin of error.

Problem 4

**Given:**

The textbook has 437 pages.

Thickness is 1.24 0.0050 inches.

**Find:**

The thickness of 1 page including its uncertainty

**Diagram:**

N/A

**Theory:**

A picture containing calendar

Description automatically generatedDiagram

Description automatically generated

**Assumptions:**

All pages are equally thick.

**Solution:**

Calendar

Description automatically generated with medium confidence

Problem 5

**Given:**

grams

grams

**Find:**

* An equation for the uncertainty in the expected acceleration in terms of m1, m2, and their uncertainties.
* The expected acceleration and the propagated uncertainty

**Diagram:**

**A picture containing white

Description automatically generated**

**Theory:**

**for Q = ab**

**Assumptions:**

The pully is frictionless.

**Solution:**

Diagram

Description automatically generated