

Experimental Physics
2019

Homework: Due Monday, May 6.

1. The data at the right shows the period measured for the oscillations of a spring for the given added masses, M_w . Plot the period squared vs. the added mass to find the force constant of the spring and estimate the mass of the spring. Find the uncertainty (standard deviation) for k and the mass of the spring, M_s . These come from assuming that

$$T^2 = \frac{4\pi^2}{k} \left(M_w + \frac{M_{\text{spring}}}{3} \right)$$

Period(s)	M_{added} kg
0.6198	0.0279
0.6934	0.05
0.7569	0.0701
0.8139	0.0901
0.8672	0.1103
1.0162	0.1704
1.0607	0.1903
1.1447	0.2304

2. A cylinder has a diameter of $4.000 \text{ cm} \pm 0.010 \text{ cm}$ and a height of $2.000 \text{ cm} \pm 0.010 \text{ cm}$. It has a mass of $200.00 \text{ g} \pm 0.20\text{g}$. What is its density and what is the uncertainty in the density?