1. The graph displays the stretch of a spring (in cm) as a function of applied weight (N)
   a) For what range of stretch values would you expect to observe simple harmonic motion (SHM)? Explain!

   b) Use the graph to determine the approximate spring constant for the range of stretch values found in (a).

   c) If a 0.13 kg mass is now attached to the spring, stretched 2.0 cm and released, determine the period and frequency of the ensuing motion.

   d) For the mass in (c), at what time after being released will the mass be at position 1.0 cm?

   e) What fraction of total energy is kinetic when the mass is at the position in (d)?

2. A pendulum of length 0.4 m is released at an angle of \( \pi/8 \) from equilibrium
   a) Explain why you would expect to see SHM displayed by the pendulum’s mass.

   b) Calculate the period and frequency of the pendulum

   c) Determine the total distance traveled by the mass in one period.