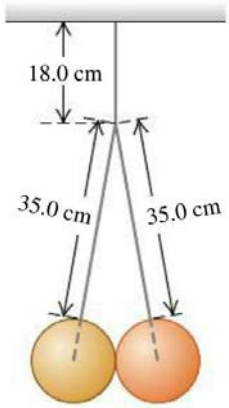
Physics 9A Section A Discussion Questions: Week 4

Question 1: Review of Midterm Problems (if requested)

Question 2: Two hanging masses

5.85 ••• Two identical 15.0-kg balls, each 25.0 cm in diameter, are suspended by two 35.0-cm wires (**Fig. P5.85**). The entire apparatus is supported by a single 18.0-cm wire, and the surfaces of the balls are perfectly smooth. (a) Find the tension in each of the three wires. (b) How hard does each ball push on the other one?



Question 3: Time dependent tension

A 8.00 kg block is suspended from a massless string several hundred meters in the air. The tension in the string varies with time, and is given as $T = 100\ \left(\frac{N}{s}\right) t$. The only forces acting on the block are gravity and tension.

i: If the block is stationary at t=0, what is the block velocity at t = 1s and t = 5s?

ii: How far does the block descend below its initial position? How long does this take?

ii: How long will it take the block to return to its initial position?

Question 4 : Work done by different forces

An 3.1 kg block is being dragged up a ramp at constant speed by a rope with tension $T = 10\ N$. The ramp is angled at $30°$, and the coefficient of kinetic friction $\mu_k = .38$.

i: What are the magnitudes and direction of the frictional force, and the normal force?

ii: If the block is dragged 5.0 m, what is the work done on the block by all the forces separately?

iii: What is the total work done on the block?