**Worksheet 3.5 Torque (part 1)**

1) If the torque needed to loosen a lug nut is 45 Nm and you are using a 35 cm wheel wrench, what force do you need to exert perpendicular to the end of the wrench   (130 N)

2) A beam of negligible mass is attached to a wall by a hinge. Attached to the center of the beam is a 400 N weight.   A rope supports the beam as shown in the diagram. What is the tension in the rope?   (200 N)
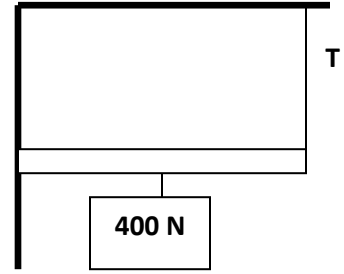
3) Two students sit on either end of a uniform teeter-totter. Student 1 sits 1.10 m from the pivot while Student 2 sits 0.85 m from the pivot. If Student 1 has a mass of 72 kg, what is the mass of Student 2?

(93 kg)

4) A 0.75 kg bird stands on a uniform 1.0 kg stick as shown. The stick is attached to a wall with a hinge and to the ceiling with a rope of negligible mass. What is the tension in the rope?   (10. N)
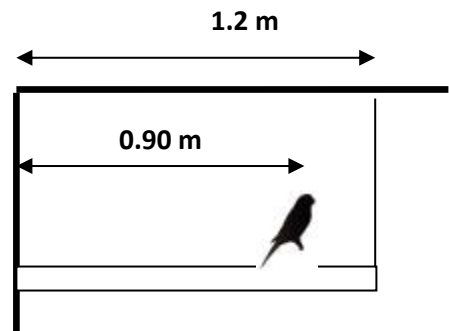
5) Two masses (m$_1$ = 3.00 kg, m$_2$ = 5.00 kg) hang from the ends of a metre stick as shown. If the mass of the metre stick is negligible, at what distance from the left of the metre stick should a pivot be placed so that the system will be balanced?   (0.625 m)
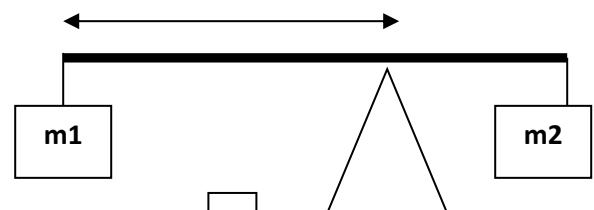
6) A 650 N student stands on a 250 N uniform beam that is supported by two supports as shown in the diagram. If the supports are 5.0 m apart and the student stands 1.5 m from the left support:
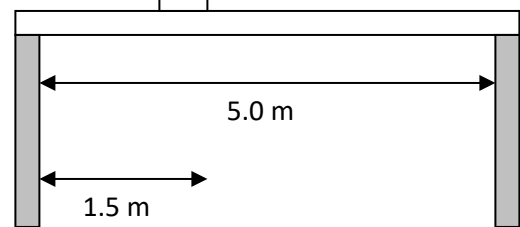
a) What is the force that the right support exerts on the beam?
                    (320 N)

b) What is the force that the left support exerts on the beam?
                    (580 N)

7) A uniform 400 N diving board is supported at two points as shown in the diagram. If a 75 kg diver stands at the end of the board, what are the forces acting on the each support   (left support = 2.61x10^3 N down, right support = 3.74x10^3 N up)