Rigid Body Equilibrium

Pre-Class Questions

Problem Set (due next time)
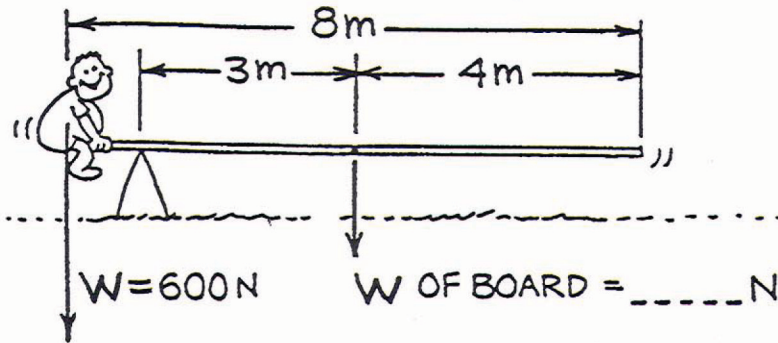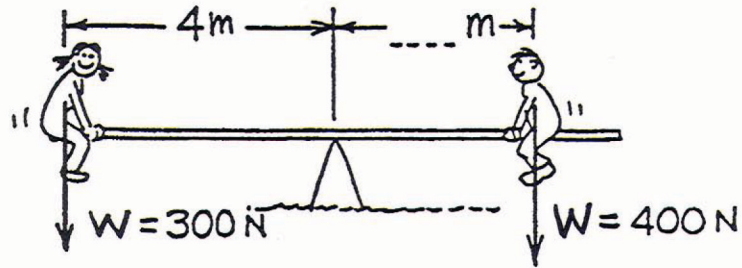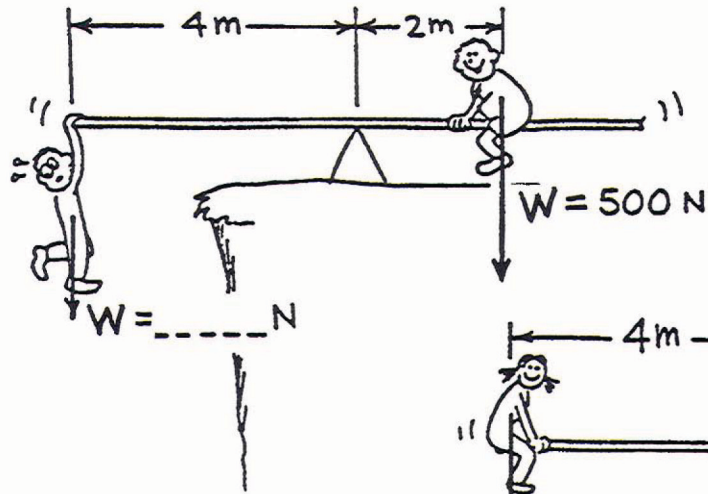Ch 10 - 38, 44, 47, 49

Lecture Outline
1. The Definition of Equilibrium
2. Equilibrium Examples

Fill in the blanks for the three seesaws in equilibrium.

|← 4m →|← 2m →|

W = 500 N

W = _____ N

|← 4m →|← ___ m →|

W = 300 N   W = 400 N

|← 8m →|
|← 3m →|← 4m →|

W = 600 N   W OF BOARD = _____ N

Example 1: A 5.00kg piñata is hung from the middle of a 4.00m long rope. Find the tension in the rope if it sags 20.0cm.

Example 2:A 20.0kg board 4.00m long is supported at each end. A 70.0kg person stands 1.00m from the left side. Find the force exerted by each support.

Example 3: A 1.00kg book leans against the smooth side of a bookshelf making a 53.0˚ angle with the horizontal. Find the forces that act on the book.

Lecture 26 - Summary

A system in equilibrium feels no net force and no net torque.

$$\Sigma\vec{\tau}_P = 0 \qquad\qquad \Sigma\vec{F} = 0$$