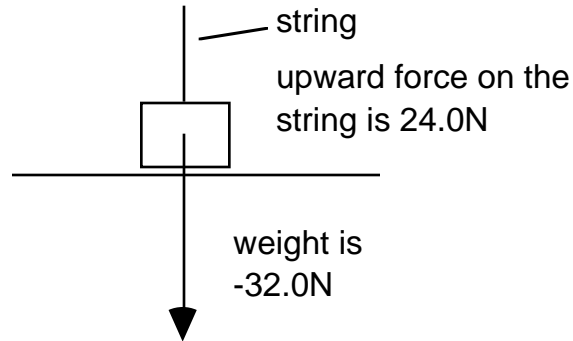
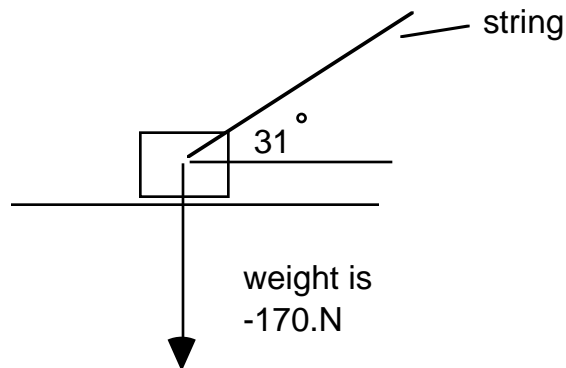


Equilibrium : W.S.-22

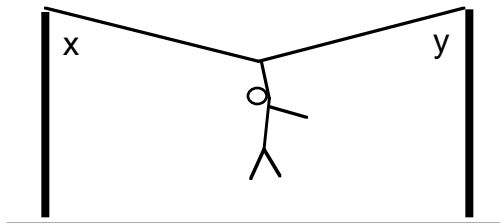
1)a) Find the normal force acting on the box below.



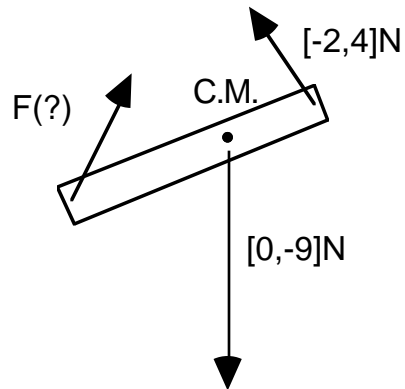
b) The force on the string is 280.N. The box moves to the right at a constant speed. Find the normal force and the force of friction.



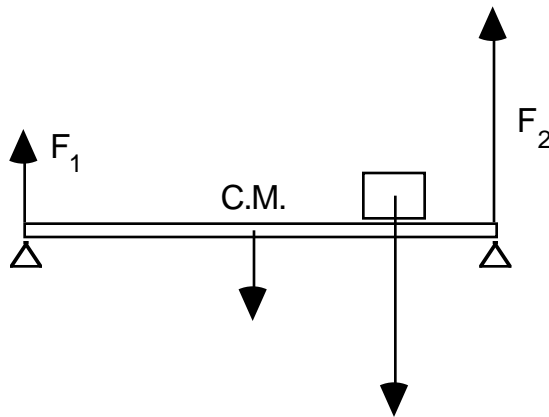
2) A 72kg man hangs from the middle of the cable. The angles x and y are both equal to 82 degrees. Find the tension in the cable.



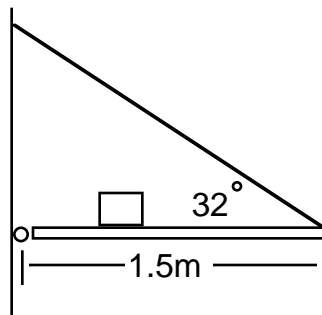
3) An object at equilibrium has three forces acting on it. Two of the forces are given. Find the third force F .



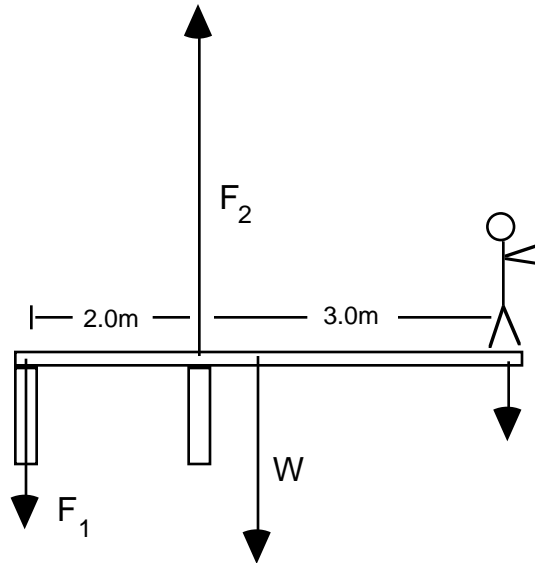
4) A 20.m long beam has a mass of 1500kg. A 4500kg load is placed 4.0m from the end. Find F_1 and F_2 .



5) A 28kg bar is suspended by the cable. The mass of the box is 14kg. The box is 0.50m from the hinge. Find the tension in the cable, and find the force exerted by the hinge.



6) A 45kg person stands on a 120kg diving board. Find F_1 and F_2 .



Answers: 1)a) 8.0N [up], b) $\mathbf{N} = 26\text{N}$ [up], $\mathbf{F}_{\text{friction}} = 240.\text{N}$ [left], or $-240.\text{N}$, 2) $T = 2500\text{N}$, 3) $\mathbf{F} = [2,5]\text{N}$, 4) $\mathbf{F}_1 = 16,000\text{N}$ [up], $\mathbf{F}_2 = 43,000\text{N}$ [up], 5) $T = 350\text{N}$, $\mathbf{F}_{\text{hinge}} = [290,230]\text{N}$, 6) $\mathbf{F}_1 = 1.0 \times 10^3\text{N}$ [down], $\mathbf{F}_2 = 2600\text{N}$ [up].