Class work problems on module 4.1 - 2022

1. A roller of mass 3 kg is supported by string as shown in fig. Find the tension in the string and reaction at point B if the system is in equilibrium. Given AC = 120 mm.

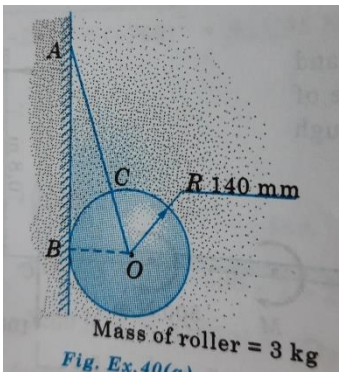
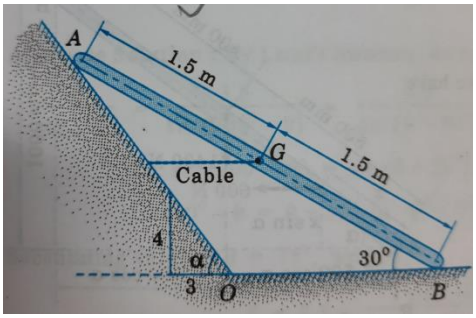
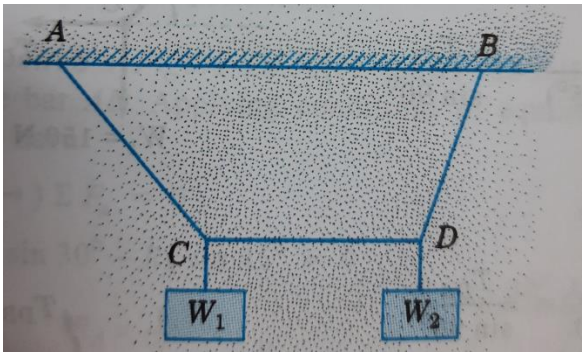


Fig. Ex. 4.0(a)

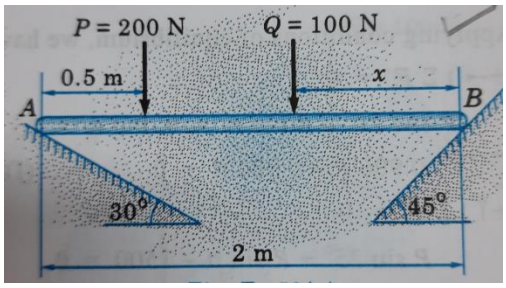
2. Determine the mass of the pipe that can be supported as shown in the fig. knowing that the maximum allowable tension in the cable is 20 kN. Neglect friction.



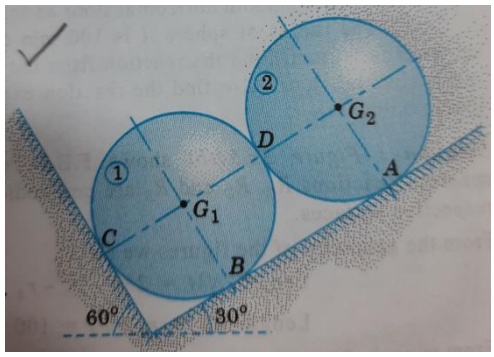
3. Rope AB 4.5 m long is connected at two points A & B at the same level & 4 m apart. Load of 1500 N is suspended at point C as shown in fig. What load should be connected at point D to maintain the shown position? Take AB = 4 m, AC = 1.5 m, BD = 1 m and W_1 = 1500 N.



4. A bar 2 m long and of negligible weight rests in horizontal position on two smooth inclined planes. Determine the distance x at which the load Q = 100 N should be placed from point B to keep the bar horizontal.



5. Two homogeneous spheres of identical weight of 5000 N and radius of 0.4 m are resting against inclined wall and sloping ground as shown in fig. Assuming all surfaces are smooth, find reactions at A, B, C and D.



6. Two spheres A & B of weight 1000 N and 750 N respectively are kept as shown in the fig. Determine the reactions at all contact points 1, 2, 3 & 4. Radius of A = 400 mm & Radius of B = 300 mm.