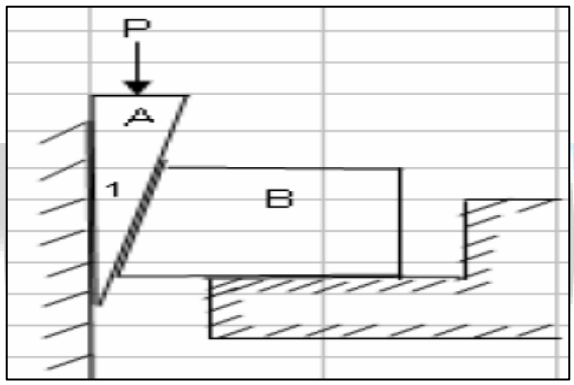
MECHANICS OF SOLIDS

ASSIGNMENT: 3

1. A 15^0wedge 'A' is pushed to move block 'B' weighing 1200 N as shown in figure. Determine the minimum force 'P' required to move the block if the coefficient of friction for all contact surfaces is 0.25. Neglect the self-weight wedge.



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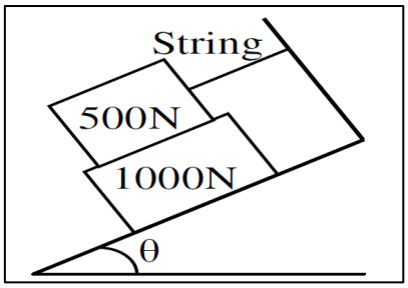
2. A ladder 6 m long, rests on horizontal ground and leans against a smooth vertical wall making an angle of 200 with the wall. Its weight is 1000 N and it ison the point of sliding when a man weighing 500 N stands on it at a distance of2.2 m from the foot of the ladder. Calculate the coefficient of friction.

3. A ladder is supported by a horizontal floor and a vertical wall. The weight of ladder is 200N. The coefficient of friction at the wall is 0.2 and at the floor is0.4. A man of weight of 600N is to climb on it. Determine the minimum inclination of the ladder with horizontal floor so that the man can climb the full height of ladder without slipping.

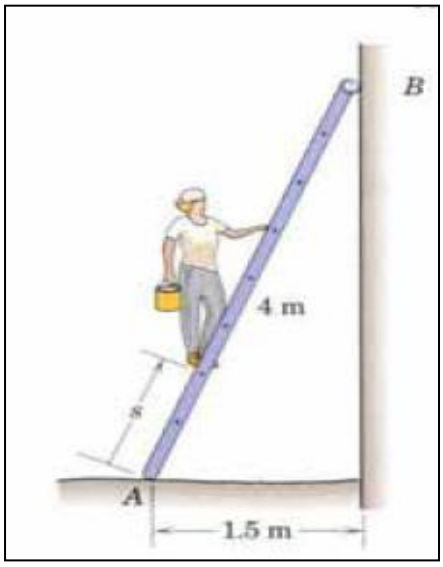
4. What should be the value of _ in figure which will make the motion of1000N block down the plane to impend? The coefficient of friction for allcontact surfaces is 1/3.



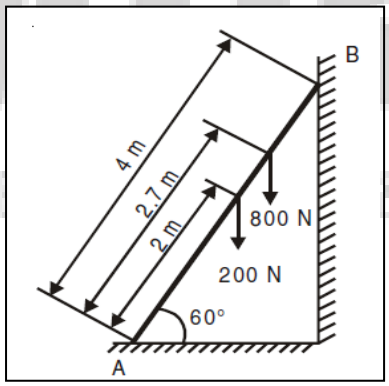
5. A body of weight 500N is pulled up an inclined plane, by a force of 350N. The inclination of the plane is 30º to the horizontal and the force is applied parallel to the plane. Determine the coefficient of friction.

6. A pull of 180 N applied upward at 30° to a rough horizontal plane was required to just move a body resting on the plane while a push of 220 N applied along the same line of action was required to just move the same body downwards. Determine the weight of the body and the coefficient of friction.

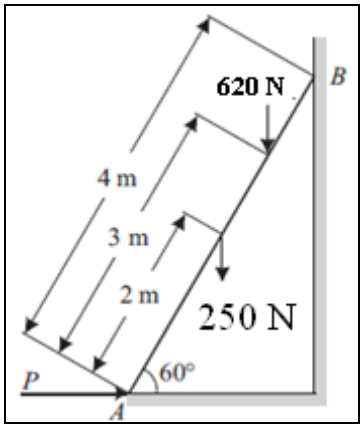
7. Determine the distance x to which the 90 kg painter can climb without causing the 4-m ladder to slip at its lower ends A. The top of the 15kg ladder has a small roller, and at the ground the coefficient of static friction is 0.25. The mass center of the painter is directly above her feet.



8. A 4 m ladder weighing 200 N is placed against a vertical wall as shown in Fig. 4.2 as a man weighing 800 N, reaches a point 2.7 m from *A*, the ladder is about to slip. Assuming that the Coefficient of friction between the ladder and the wall is 0.2, determine the coefficient of friction between the ladder and the floor.



9. A ladder of length 4 m, weighing 250 N is placed against a vertical wall as shown in Fig. 4.3. The coefficient of friction between the wall and the ladder is 0.25 and that between floor and the ladder is 0.39. The ladder, in addition to its own weight, has to support a man weighing 620 N at a distance of 3 m from A. Calculate the minimum horizontal force to be applied at A to prevent slipping.



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