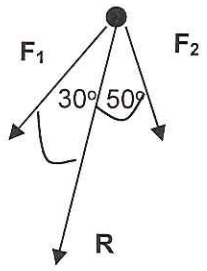
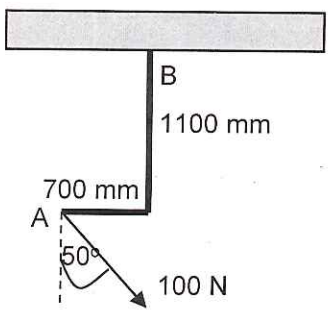
1) (4 Points)
Two forces are acting at a point as shown. The resultant is known to be 5000 N. What is the magnitude of F_1



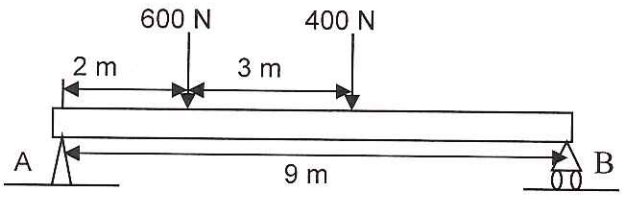
a. 2100 N
b. 3900 N
c. 5700 N
d. 6300 N

2) (4 Points)
What is the moment of the force about B for the system shown?



a. 110 N-m
b. 130 N-m
c. 160 N-m
d. 190 N-m

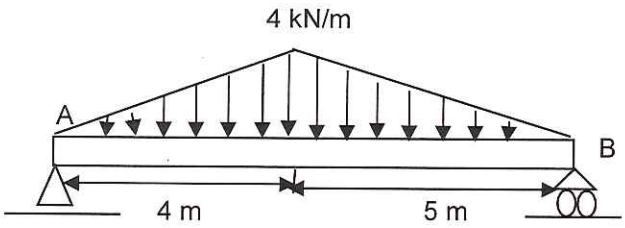
3) (4 Points)
The reaction at B is closest to:



a. 356 N
b. 424 N
c. 740 N
d. 930 N

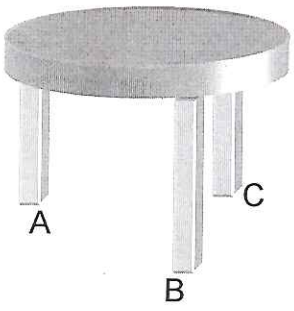
NAME: _____

4) (4 Points)
The reaction at A is closest to:



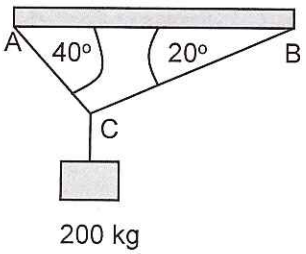
a. 8450 N
b. 7280 N
c. 9330 N
d. 3540 N

5) (4 Points)
The stool shown weighs 30 lbs and has a diameter of 18 inches. It is supported by three legs spaced equally around the edge. The upward reaction on each leg is.



a. 10 lbs
b. 20 lbs
c. 30 lbs
d. 40 lbs

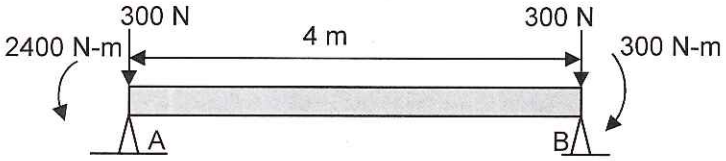
6) (4 Points)
Two cables are tied together at C and are loaded as shown. Determine the tension in cable AC.



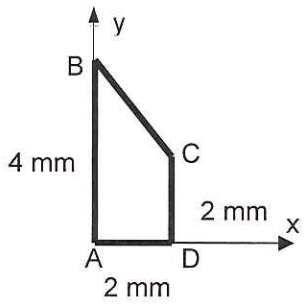
a. 3500 N
b. 1735 N
c. 1962 N
d. 2129 N

NAME: _____

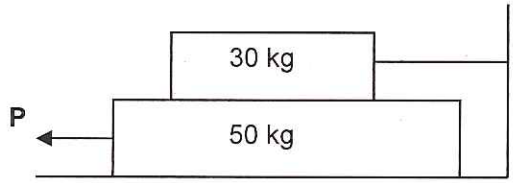
7) (6 Points)
Replace the loading for the beam shown with an equivalent force-couple system at end A. Show on a diagram



8) (6 Points)
Determine the location of the centroid for the area shown.



9) (8 points)
The coefficients of friction are μ_s = 0.5 and μ_k = 0.4 between all surfaces of contact. The contact area between the blocks is 500mm^2 and between the lower block and the floor is 1000mm^2. Determine the smallest force **P** required to start the 50 kg block moving.



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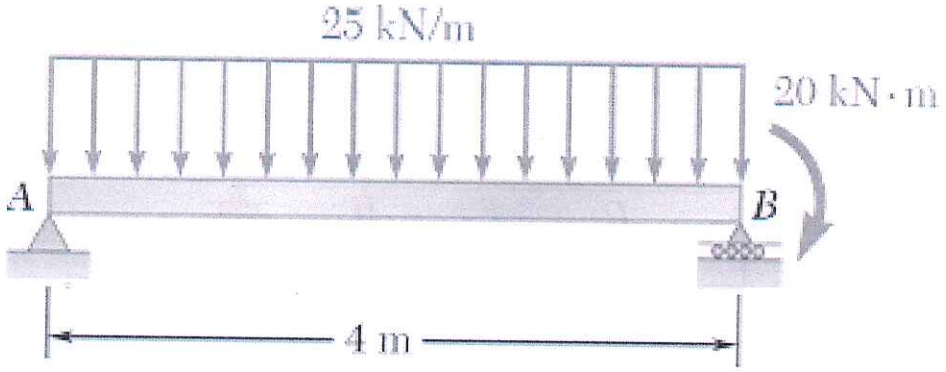
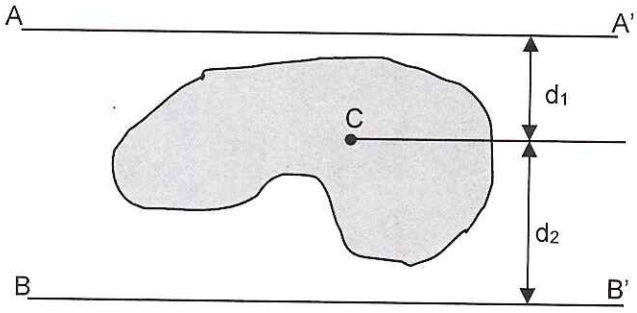
12) (14 points)
For the beam and loading shown, draw the shear and bending-moment diagrams. Include x dimension of maximum moment and value of maximum moment.



13) (14 points)
Determine for the shaded region the area and moment of inertia with respect to the centroidal axis parallel to BB', knowing that d_1 = 25 mm and d_2 = 15 mm and that the moments of inertia with respect to AA' and BB' are 7.84 x 10^6 mm^4 and 5.20 x 10^6 mm^4, respectively. NOT DRAWN TO SCALE



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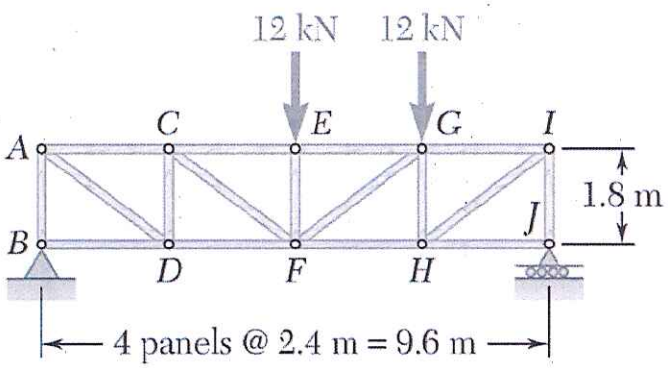
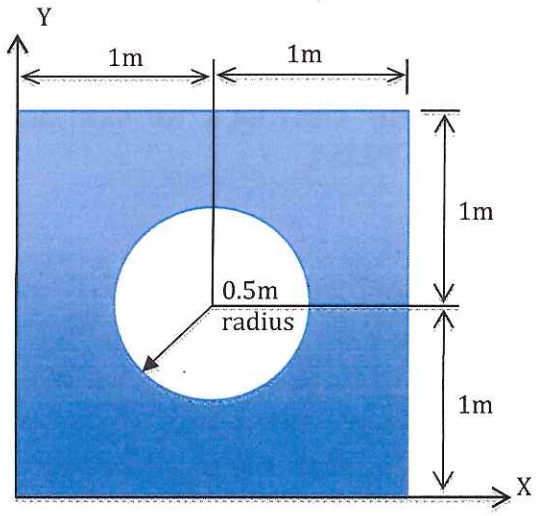
10) (14 points)
Determine the forces in members CD and DF of the truss shown. State if the member is in tension or compression.



11) (14 points)
Determine the moment of inertia of the shaded area about the x-axis.