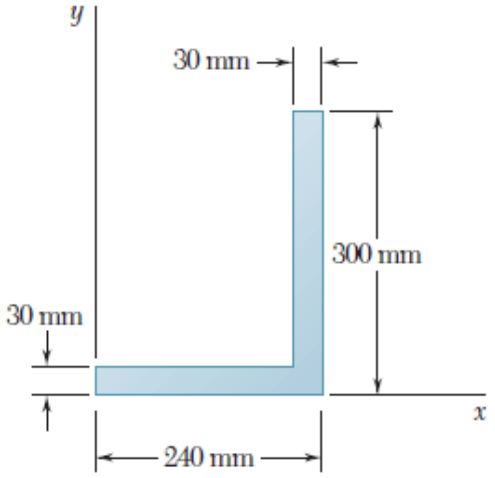
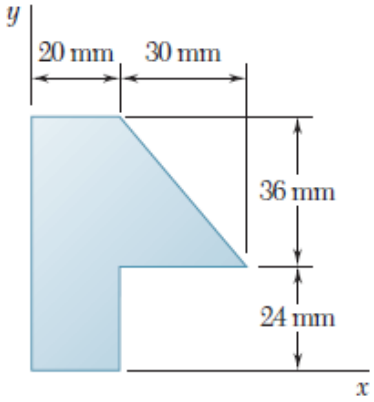
Tutorial sheet 3

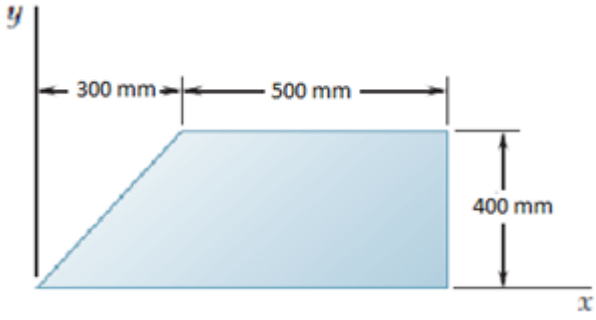
1. Locate the centroid of plane figure



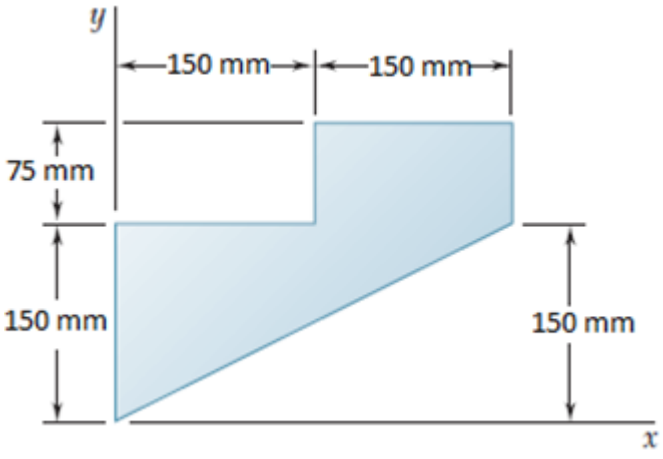
(a) **X= 175.6 mm and Y=94.4 mm**



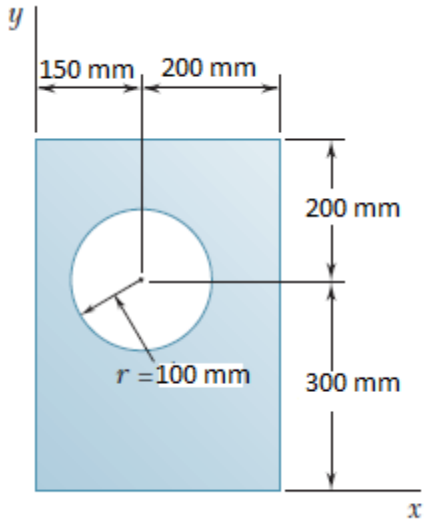
(b) **X=16.21 mm and Y= 31.9 mm**



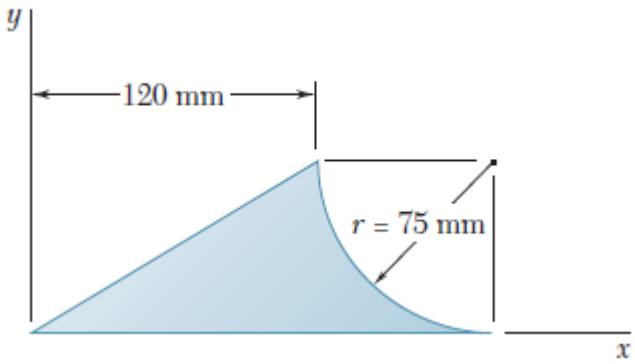
(c). X=469 mm and Y= 184.6 mm



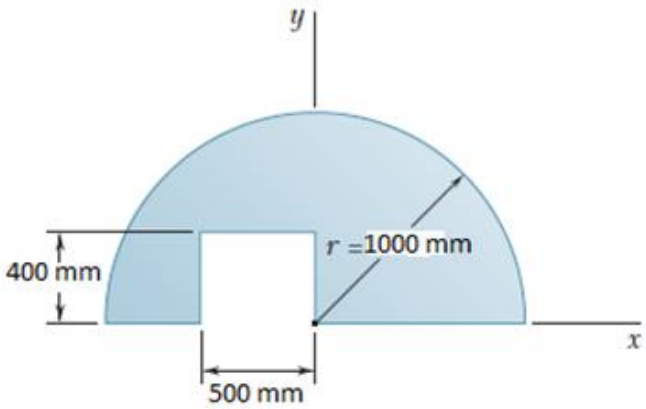
(d) X= 141.7 mm and Y= 129.2 mm



(e) X=180.5 mm and Y= 239 mm

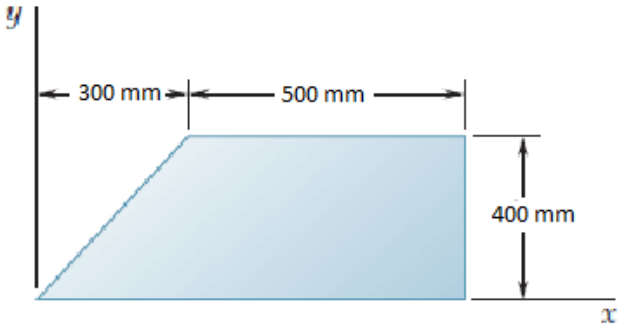


(f) X= 92 mm and Y= 23.3 mm

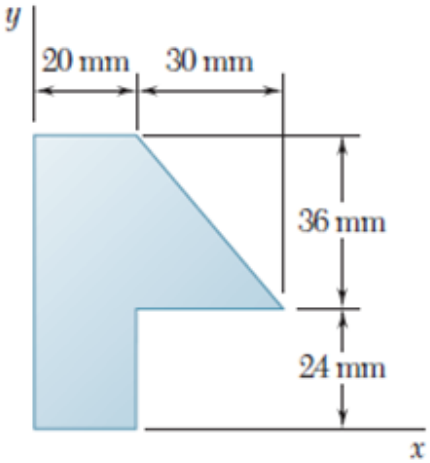


(g) X= 36.5 mm and Y= 457 mm

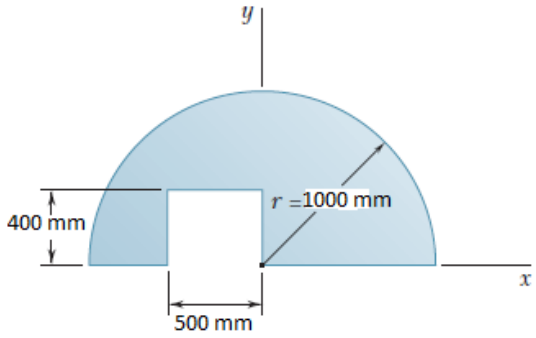
2. A thin, homogeneous wire is bent to form the perimeter of the figure indicated. Locate the center of gravity of the wire figure thus formed.



(a) X= 450 mm and Y= 172.7 mm

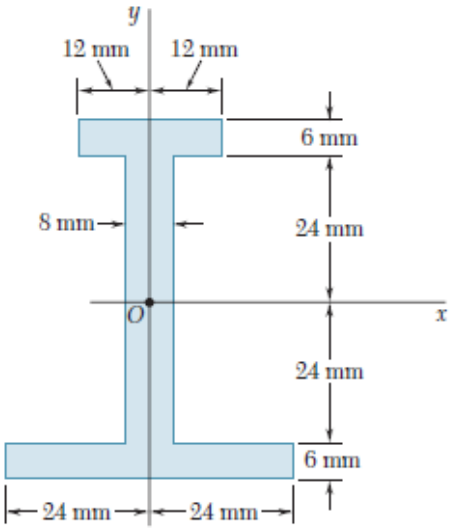


(b) X= 17.77 mm and Y=29.8 mm

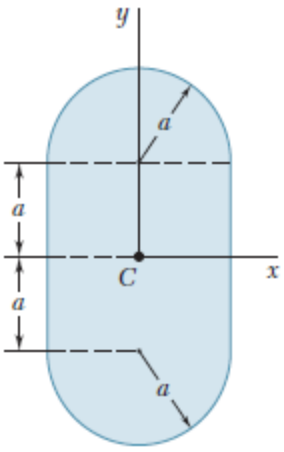


(c). X= -33.7 mm and Y=397 mm

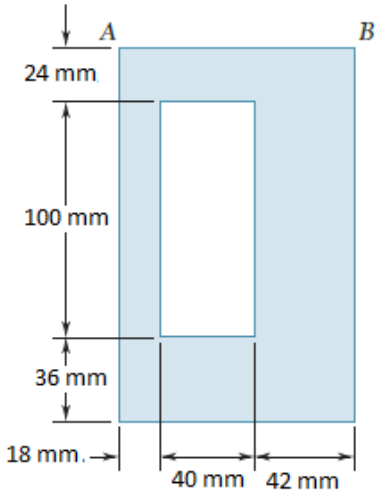
3. Determine the moment of inertia and the radius of gyration of the shaded area with respect to the *x* axis as shown in figure **(I_{xx}= 390000 mm^4 and k_x=21.9 mm)**



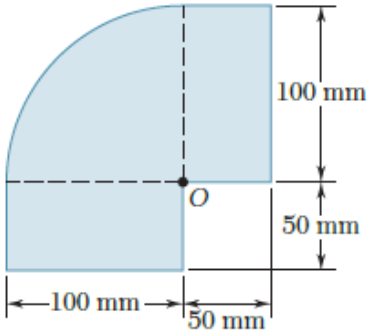
4. Determine the moments of inertia of the shaded area shown with respect to the *x* and *y* axes when a=20 mm as shown in figure **(I_{xx}=1268000 mm^4 and I_{yy}= 339000 mm^4)**



5. Determine the moments of inertia *Ix* and *Iy* of the area shown in figure with respect to centroidal axes respectively parallel and perpendicular to side *AB*. **(I_{xx}=30600000 mm^4 and I_{yy}= 12030000 mm^4)**



6. Determine the polar moment of inertia of the area shown in figure with respect to (*a*) Point *O*, (*b*) the centroid of the area. **(J_o=80900000 mm^4 and J_C= 57400000 mm^4)**



7. A rectangular hole is made in a triangular section as shown in Figure. Determine the moment of inertia of the section about X-X axis passing through its centre of gravity and the base BC **(I_{xx}=1824200 mm^4 and I_{BC}= 4815000 mm^4)**