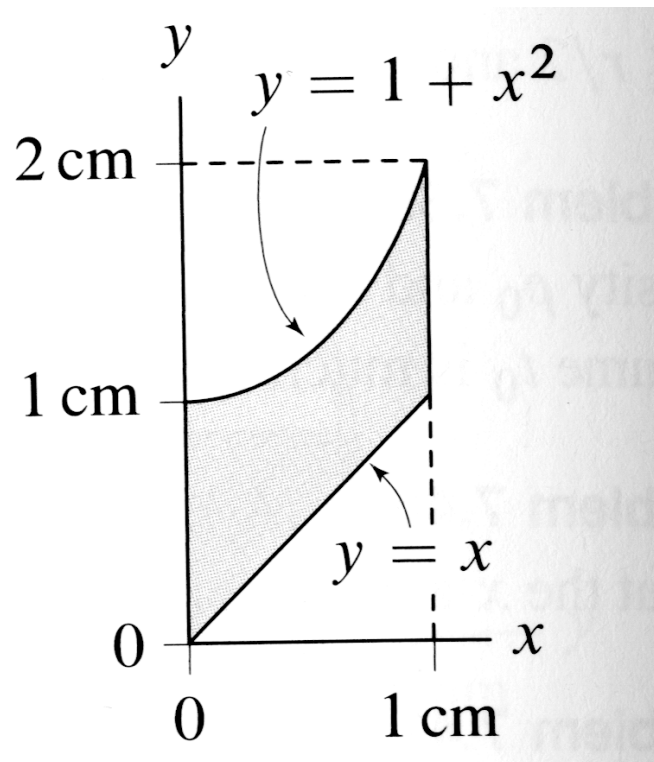
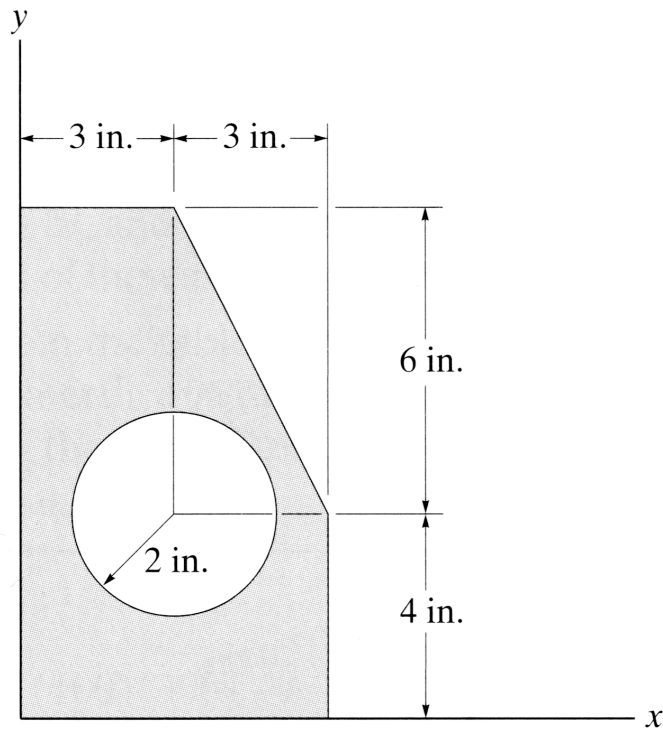


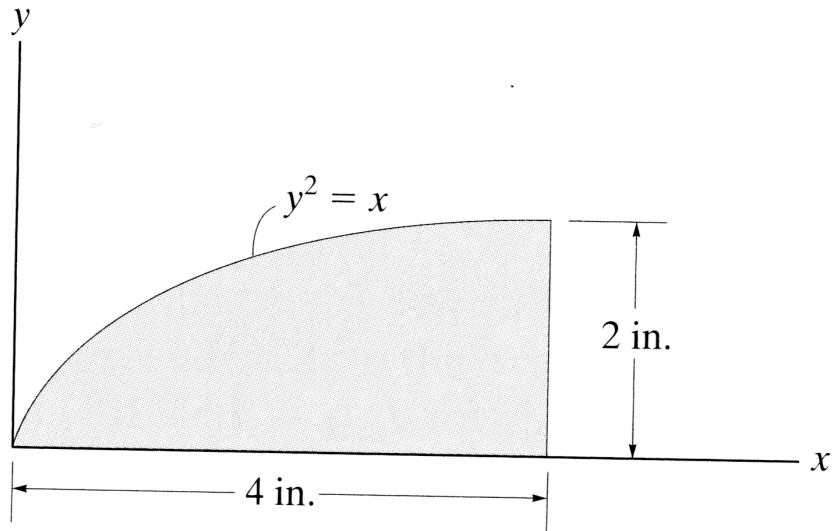
1. (25 pts) The 10 kg plate and the 20 kg box are connected with a cable as shown. If the coefficient of static friction  $\mu_s$  is 0.2 between all surfaces of contact, what is the maximum value of P for equilibrium? The pulley is frictionless. Use  $g = 9.81 \text{ m/s}^2$  for the acceleration due to gravity.



2. (25 pts) Find the  $x$ - and  $y$ -coordinates of the centroid of the area shown above.



3. (25 pts) Determine  $I_x$  for the shaded area shown above.



4. (25 pts) Find  $I_{xy}$  by direction integration for the shaded area shown above.