

5. A cantilever beam is shown in Figure 5 wherein each edge forms a curve that is a parabola given as  $y^2 = (a^2/L)x$  for the top curve (the bottom curve is a mirror image). What is the deflection curve for a tip load  $P$ ? The beam is of uniform thickness  $t$  throughout and has a constant modulus of elasticity  $E$ . Show that the deflection at tip is  $-PL^3/(Ea^3t)$  [Hint:  $I(x) = \int y^2 dA$  ] (20%)

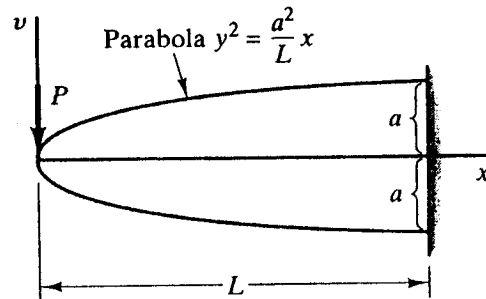


Figure 5