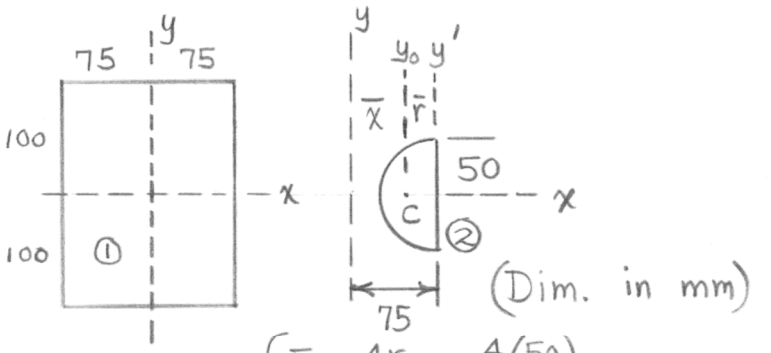
A/62



(Dim. in mm)

$$\begin{cases} \bar{r} = \dfrac{4r}{3\pi} = \dfrac{4(50)}{3\pi} = 21.2 \text{ mm} \\ \bar{x} = 75 - 21.2 = 53.8 \text{ mm} \end{cases}$$

Part I: $I_x = \frac{1}{12}(150)(200)^3 = 100(10^6)\ \text{mm}^4$

$I_y = \frac{1}{12}(200)(150)^3 = 56.2(10^6)\ \text{mm}^4$

Parts II: $I_x = \frac{1}{4}\pi(50)^4 = 4.91(10^6)\ \text{mm}^4$ (for both together)

$I_y = I_{y_0} + A\bar{x}^2 = I_{y'} - A\bar{r}^2 + A\bar{x}^2 = I_{y'} + A(\bar{x}^2 - \bar{r}^2)$

$= \frac{1}{2}\left(\frac{1}{4}\pi\, 50^4\right) + \frac{\pi(50)^2}{2}(53.8^2 - 21.2^2)$

$= 12.04(10^6)\ \text{mm}^4$ for each, $24.1(10^6)\ \text{mm}^4$ for both

Combined: $I_x = 100(10^6) - 4.91(10^6) = \underline{95.1(10^6)\ \text{mm}^4}$

$I_y = 56.2(10^6) - 24.1(10^6) = \underline{32.2(10^6)\ \text{mm}^4}$