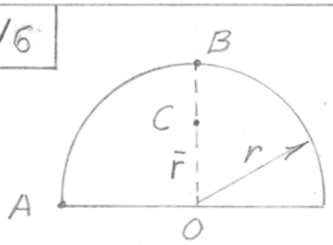
A/6



$\bar{r} = 4r/3\pi$

For complete circle

$$I_A = I_0 + Ar^2 = \frac{1}{2}Ar^2 + Ar^2 = \frac{3}{2}Ar^2$$

For half circle

$$I_A = \frac{1}{2}\left(\frac{3}{2}\pi r^4\right) = \frac{3}{4}\pi r^4$$

For half circle, $I_0 = \frac{1}{4}\pi r^4$

$$I_B = I_C + A(r-\bar{r})^2 = I_0 - A\bar{r}^2 + A(r-\bar{r})^2$$

$$= I_0 + A(r^2 - 2r\bar{r})$$

$$= \frac{1}{4}\pi r^4 + \frac{\pi r^4}{2}\left(1 - \frac{8}{3\pi}\right) = r^4\left(\frac{3\pi}{4} - \frac{4}{3}\right)$$