

$$\delta. \quad \begin{matrix} \theta = 2\pi \\ \int_{\theta=0} \end{matrix} \quad \begin{matrix} r=2 \\ \int_{r=0} \end{matrix}$$

$$x = r \cos \theta$$

$$y = r \sin \theta$$

$$I_x = \int_{\theta=0}^{\theta=2\pi} \int_{r=0}^{r=2} (r \sin \theta)^2 (1) r \, dr \, d\theta$$

$$= \int_{\theta=0}^{\theta=2\pi} \left[ \frac{1}{4} r^4 \sin^2 \theta \right]_{r=0}^{r=2} d\theta$$

$$= 4 \int_{\theta=0}^{\theta=2\pi} \left[ \frac{1 - \cos 2\theta}{2} \right] d\theta$$

$$= 4\pi$$

$$\bar{x} = \sqrt{\frac{I_y}{m}}$$

$$\bar{y} = \sqrt{\frac{I_x}{m}}$$

$$I_y = \int_{\theta=0}^{\theta=2\pi} \int_{r=0}^{r=2} (r \cos \theta)^2 (1) r \, dr \, d\theta$$

=

$$m = \int_{\theta=0}^{\theta=2\pi} \int_{r=0}^{r=2} (1 \cdot r) \, dr \, d\theta$$

=