

$$\frac{d \cos \theta}{d \theta} = -\sin \theta$$

$$\frac{d \sin \theta}{d \theta} = \cos \theta$$

$$\frac{1}{3}(-2) + 2 = \frac{4}{3}$$

$$\sin^3 \theta d \theta$$

$$= \sin^2 \theta \sin \theta d \theta$$

$$\int \cos \theta d(\cos \theta) = -\frac{1}{2} \sin^2 \theta$$

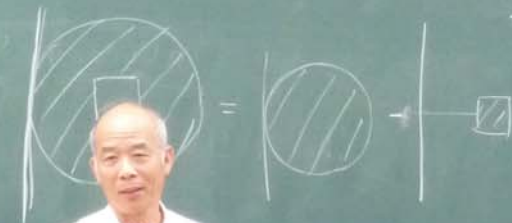
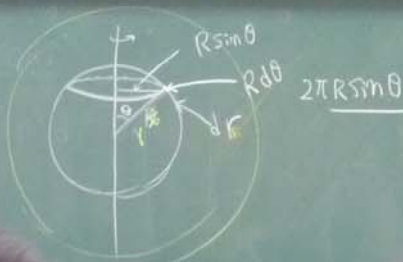
$$= (\cos^2 \theta - 1) d(\cos \theta)$$

$$\cos \theta = 1$$

$$\frac{1}{3} \cos^3 \theta - \cos \theta$$

$$\left. \begin{array}{l} \cos \theta = -1 \\ \cos \theta = 1 \end{array} \right\}$$

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$$(x+\Delta x)^2 = x^2 + 2x\Delta x + (\Delta x)^2$$

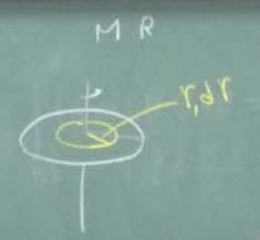
$$(x+\Delta x)^3 = x^3 + 3x^2\Delta x + 3x(\Delta x)^2 + (\Delta x)^3$$

$$(x+\Delta x)^n = x^n + n x^{n-1} \Delta x + \dots + (\Delta x)^n$$

$$\frac{d(x^n + c)}{dx} = n x^{n-1} \lim_{\Delta x \rightarrow 0} \frac{(x+\Delta x)^n - x^n}{\Delta x} = n x^{n-1}$$

$$\int_0^R r^2 \sigma 2\pi r dr$$

$$2\pi\sigma \int_0^R r^3 dr$$



$$M = \frac{2\pi\sigma}{4} \dots$$

1. 签到
2. 下次上课
3. 笔记本认领

$$2 \int_0^R \int_0^\pi (r \sin \theta)^2 r d\theta dr$$

$$2\sigma \int_0^R \int_0^\pi r^3 \sin^2 \theta d\theta dr$$

$\frac{1}{2} \sigma \int_0^\pi \sin^2 \theta d\theta = \frac{1}{2} \sigma \left[\frac{\theta}{2} - \frac{\sin 2\theta}{4} \right]_0^\pi = \frac{1}{2} \sigma \cdot \frac{\pi}{2} = \frac{\pi \sigma}{4}$

$$\frac{1}{4} MR^2$$

$$(x+ax)^2 = x^2 + 2ax + (ax)^2$$

$$(x+ax)^3 = x^3 + 3x^2(ax) + 3x(ax)^2 + (ax)^3$$

$$(x+ax)^n = x^n + n x^{n-1} (ax) + \dots + (ax)^n$$

1. 簽到
2. 為下次上課
3. 筆記本認領



$$\frac{d \cos \theta}{d \theta} = -\sin \theta$$

$$\frac{d \sin \theta}{d \theta} = \cos \theta$$

$$\frac{1}{3}(-1) + 2 = \frac{4}{3}$$

$$\sin^3 \theta d\theta$$

$$= \sin^2 \theta \sin \theta d\theta$$

$$\int \cos \theta = -\sin \theta d(\cos \theta)$$

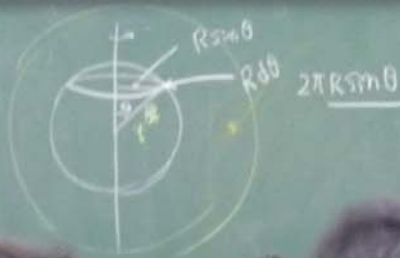
$$= (\cos^2 \theta - 1) d(\cos \theta)$$

$\cos \theta = 1$

$$\frac{1}{3} \cos^3 \theta - \cos \theta$$

$\cos \theta = -1$

$\cos \theta = 1$



1. 筆記
2. 下次上課
3. 認領

$$\int_{\theta=0}^{\pi} R^2 \sin^3 \theta \cdot 2\pi R^2 \sin \theta d\theta$$

$$2\pi R^4 \int_{\theta=0}^{\pi} \sin^3 \theta d\theta = \frac{4}{3}$$

$$\frac{2 \cdot 4}{3} \pi R^4 \Rightarrow \frac{4}{3} \pi R^4$$

$$\frac{d \cos \theta}{d \theta} = -\sin \theta$$

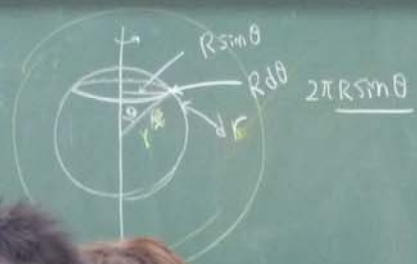
$$\frac{d \sin \theta}{d \theta} = \cos \theta$$

$$\frac{1}{3}(-2) + 2 = \frac{4}{3}$$

$$\int \sin^3 \theta d\theta = \int \sin^2 \theta \sin \theta d\theta$$

$$= \int (\cos^2 \theta - 1) d(\cos \theta)$$

$$\left. \frac{1}{3} \cos^3 \theta - \cos \theta \right|_{\cos \theta = 1}^{\cos \theta = -1}$$



筆記本認領
下次上課

$$\int_{R_1}^{R_2} \int_0^{\pi} \int_0^{2\pi} \rho \sin^2 \theta d\theta d\phi dr$$

$$2\pi \frac{4}{3} \int_{R_1}^{R_2} r^2 dr = \frac{8\pi}{3} \left[\frac{r^3}{3} \right]_{R_1}^{R_2} = \frac{8\pi}{9} (R_2^3 - R_1^3)$$

$$M = \frac{4}{3} \pi (R_2^3 - R_1^3) \rho$$

