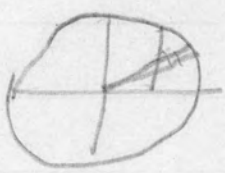
Exam
Math II

$V = \frac{1}{a} \iint (c^2 - \ldots$

$\int r^2 \cos\varphi$

$V = 2\pi \iint r^2 \sin\varphi \, dr \, d\varphi$



$= \frac{2}{3}\pi a^3 \int \sin\varphi \, d\varphi$

$= -\frac{2}{3}\pi a^3 \cos\varphi \Big]_0^{\frac{\pi}{2}}$

$= \frac{2}{3}\pi a^3$

$2V = \frac{2}{3}$

~~$V = 2\pi \iint r^2$~~

$V = 2\pi \iint \frac{1}{2} r^2$

16 2/3
16 2/3
16
12
16 2/3
16 0/3
94 2/3

$V = 2\pi \int r^2 \sin\varphi \, dr \, d\varphi$

$\frac{2}{3}\pi a^3 \int \sin\varphi \, d\varphi$

$-\frac{2}{3}\pi a^3 \cos\varphi \Big]_0^{\frac{\pi}{2}}$

$V = \frac{2}{3}\pi a^3$

$2V = \frac{4}{3}\pi a^3$

$2\pi \iint r \sin\varphi \, r \, dr \, d\varphi$

$2\pi \iint r^2 \sin\varphi \, dr \, d\varphi$

$\frac{2}{3}\pi a^3 \int \sin\varphi \, d\varphi$

~~$\frac{2}{3}\pi a^3 \frac{\pi}{2} = \frac{2}{6}\pi a^3$~~

$\frac{2}{\pi}$

$V = \iiint dy \, r \, dz$

$z^2 + \frac{a^2 y^2}{x^2} = c^2$

$x = a(\theta + \sin\theta)$

$dx = a(1 + \cos\theta)\, d\theta$

$dx^2 = a^2(1 + 2\cos\theta + \cos^2\theta)\, d\theta^2$

$y = a(1 - \cos\theta)$

$dy^2 = a^2 \sin^2\theta\, d\theta^2$

$ds^2 = 2a^2(1 + \cos\theta)\, d\theta^2$

$ds = a\sqrt{2}(1 + \cos\theta)^{\frac{1}{2}} d\theta$

$ds = a\sqrt{2}\cos\frac{\theta}{2}\, d\theta$

$= 2a\cos\frac{\theta}{2}\, d\theta$

$\bar{x} = \dfrac{\int a(\theta + \sin\theta)\, 2a\cos\frac{\theta}{2}\, d\theta}{4a}$

$\bar{x} = \dfrac{\int 2a\left(\frac{\theta}{2} + \sin\frac{\theta}{2}\cos\frac{\theta}{2}\right) 2a\cos\frac{\theta}{2}\, d\theta}{4a}$

$\bar{x} = 2a\left[\frac{\theta}{2}\sin\frac{\theta}{2} + \cos\frac{\theta}{2} + \sin\frac{\theta}{2}\cos^2\frac{\theta}{2}\right]$

$u = \frac{\theta}{2} \quad dv = \cos\frac{\theta}{2}\, d\theta$

$du = \frac{d\theta}{2} \quad v = \sin\frac{\theta}{2}$

$y = a(1 - \cos\theta)$

$dy = a\sin\theta\, d\theta$

$dy^2 = a^2\sin^2\theta\, d\theta^2$

$ds = 2a\cos\frac{\theta}{2}\, d\theta$

$ds = \sqrt{r^2 + r^2}\, d\phi^2$

$r = 2a(1 - \cos\phi)$

$dr = 2a\sin\phi\, d\phi$

$dr^2 = 4a^2\sin^2\phi\, d\phi^2$

$ds = \sqrt{(4a^2\sin^2\phi + r^2)}$

$ds = \sqrt{4a^2\sin^2\phi + 4a^2(1 - \cos\phi)^2}\, d\phi^2$

$= 2a\sqrt{\sin^2\phi + 1 - 2\cos\phi + \cos^2\phi}\, d\phi$

$= 2a\sqrt{2}(1 - \cos\phi)^{\frac{1}{2}} d\phi$