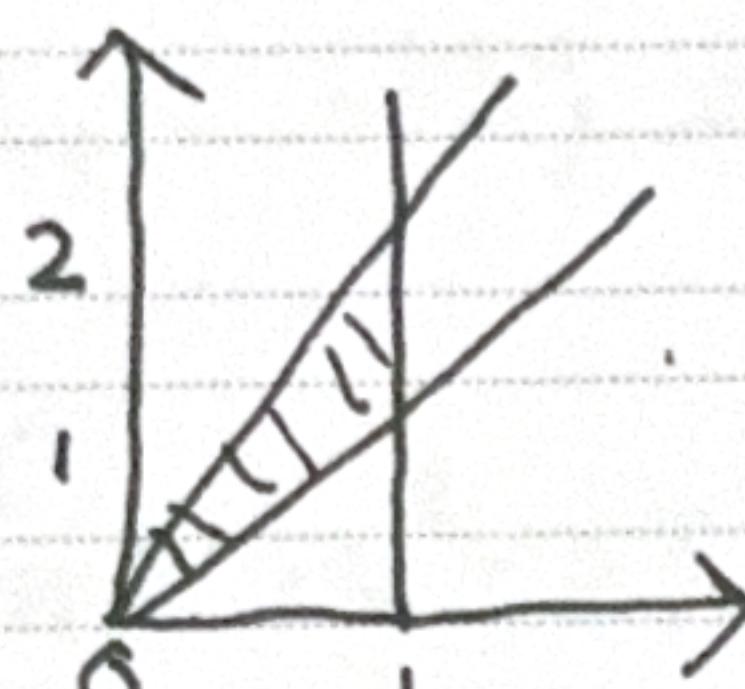


Problem 1

a)



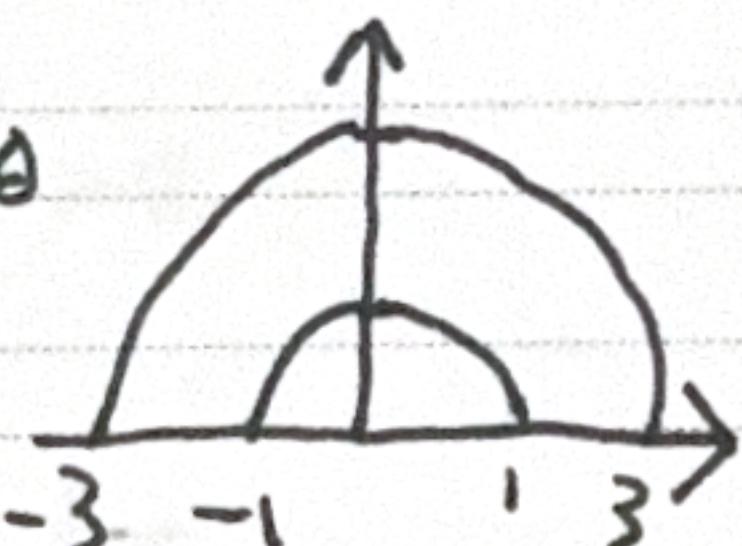
b)

$$\int_0^{\frac{1}{2}} 1 dy + \int_{\frac{1}{2}}^2 1 dy$$

✓

Problem 2

a) $\int_0^{\pi} \int_0^3 \delta r dr d\theta$



$$= \int_0^{\pi} \int_0^3 \frac{r \sin \theta}{r^2} r dr d\theta$$

$$= \int_0^{\pi} \int_0^3 \sin \theta = 2 \int_0^{\pi} \sin \theta d\theta = -2 \cos \theta \Big|_0^{\pi}$$

$$= 2 + 2 = 4$$

b) ~~Boundary~~

~~Mass~~ $\int_0^{\pi} \int_0^3 \frac{r \cos \theta r \sin \theta}{r^2} r dr d\theta$

~~So it is 4~~

Problem 3

a) $M_y = -12y = N_u = -12y$ ✓

b) $f_u = 3u^2 - 6y^2$

$\Rightarrow f = u^3 - 6uy^2 + g(y)$

$f_y = -12uy + 4y$

$f_y = -12uy + g'(y)$

$\Rightarrow g'(y) = 4y \Rightarrow g(y) = 2y^2 + C$ ✓

$\Rightarrow f = u^3 - 6uy^2 + 2y^2$

c) $-f(1,0) + f(0,1) = -1 + 3 = 2$ ✓

Problem 4 $u = \cos t, v = \sin t$

a) $\int (5\cos t + 3\sin t)(-\sin t) dt$
 $+ ((1) + \cos(\sin t))(\cos t) dt$ ✓

b) $\int_0^{2\pi} \int_0^1 (0 - 5\cos\theta - 3)r dr d\theta$

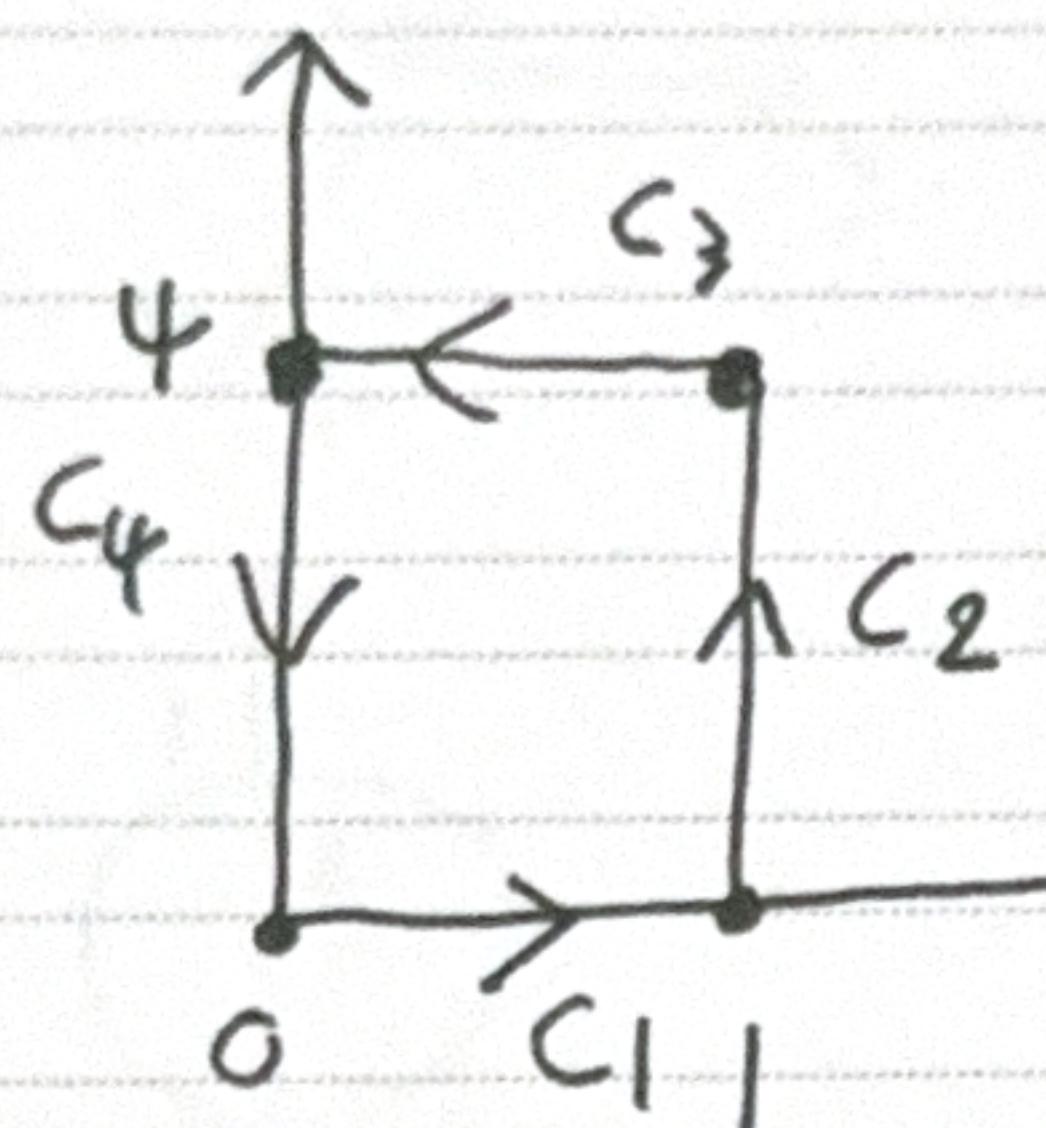
inner $= -5r\cos\theta - 3r^2 \Big|_0^1 = -5\cos\theta - \frac{3}{2}$

outer $\cos 5\sin\theta - \frac{3}{2}\theta \Big|_0^{2\pi} = -6\pi$ ✓

Subject:

Year. Month. Date. ()

Problem 5



$$\int_0^4 \int_0^y (4+y + \cos y) dy dx$$

+ - 65 accuracy

$$= \int_0^4 \int_{0^4}^y y^2 dq dy$$

$$\checkmark = \frac{y^3}{3} \Big|_0^4 = 8$$

61 ~~more. C4 is a side~~ $F_{C4} = -5 \sin j$

$$\checkmark h = -l i \Rightarrow F.h = 0$$

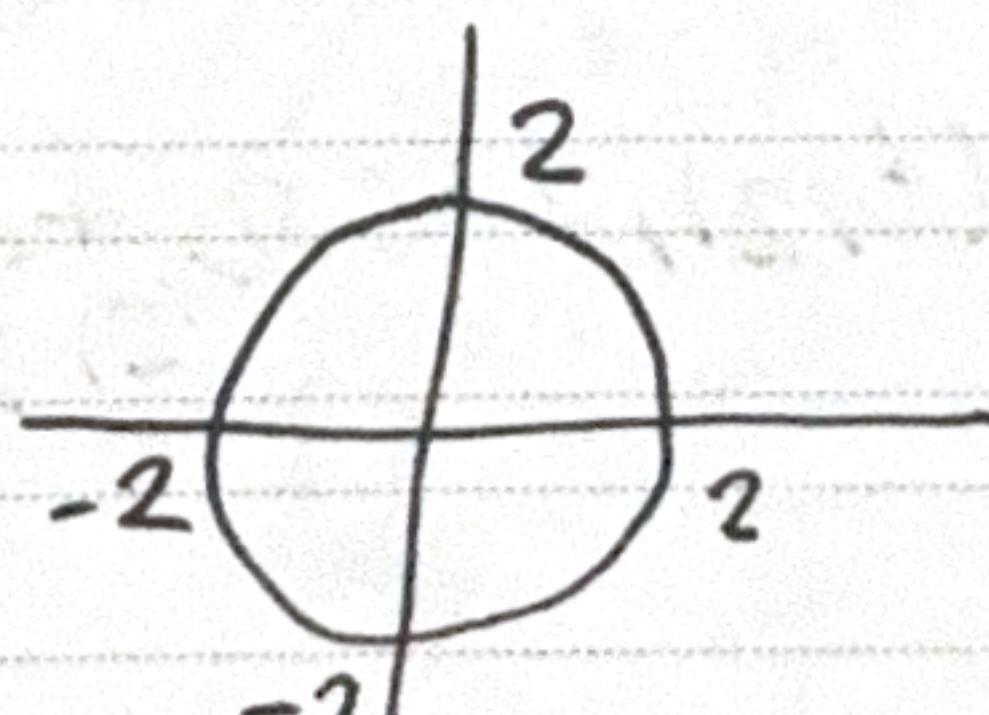
Problem 6.

$$u = 2\pi - y$$

$$u^2 + v^2 = 4$$

$$v = \pi + y - 1$$

$$\begin{vmatrix} u_1 & v_1 \\ u_2 & v_2 \end{vmatrix} = 3$$



$$\int_0^{2\pi} \int_0^2 r dr d\theta = \frac{8\pi}{3}$$