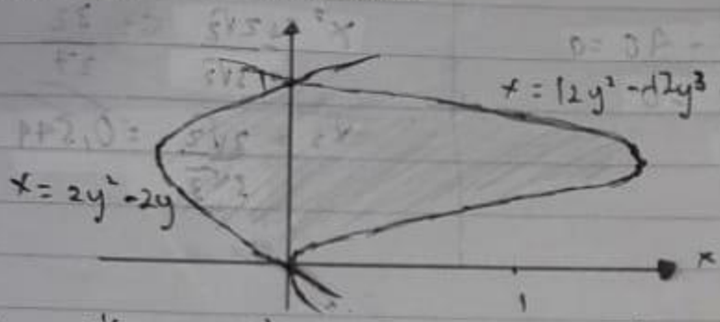
Date

Nama : Muchammad Daniyal Kautar
NIM (Fakultas) : 52800

1. Tentukan luas dari area berikut



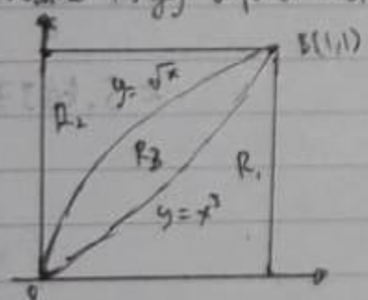
$$L = \int_0^1 (12y^2 - 12y^3) - (2y^2 - 2y)\, dy = \int_0^1 10y^2 - 12y^3 + 2y \, dy$$

$$= \frac{10}{3} y^3 - 3y^4 + y^2 \Big|_0^1$$

$$= \frac{10}{3} 1^3 - 3.1^4 + 1^2 = \frac{10}{3} - 3 + 1$$

$$= \frac{9}{3} = 1{,}33$$

2. Tentukan volume R3 yg diputar thd sumbu x



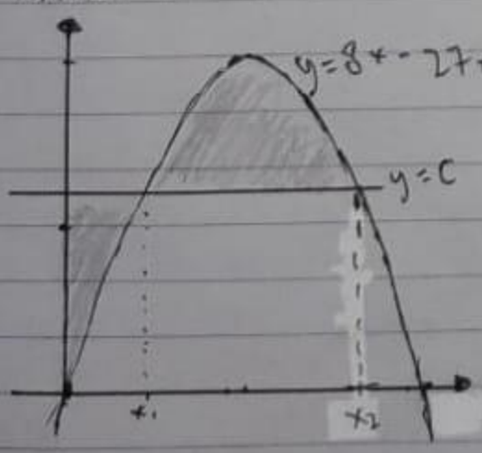
$$V = \pi \int_0^1 (\sqrt{x}^2 - (x^3)^2)\, dx$$

$$= \pi \int_0^1 (x - x^6)\, dx = \pi \left(\frac{1}{2}x^2 - \frac{1}{7}x^7 \Big|_0^1 \right)$$

$$= \pi \left(\frac{1}{2} - \frac{1}{7} \right)$$

$$= \pi . \frac{5}{14} = \frac{5\pi}{14}$$

3. Tentukan nilai c



$$\int_{x_1}^{x_2} 8x - 27x^3 - c \, dx = \int_0^{x_1} c - (8x - 27x^3)\, dx$$

$$\int_{x_1}^{x_2} 8x - 27x^3 \, dx + \int_0^{x_1} 8x - 27x^3 \, dx = \int_0^{x_1} c \, dx + \int_{x_1}^{x_2} c \, dx$$

$$\int_0^{x_2} 8x - 27x^3 \, dx = \int_0^{x_2} c \, dx$$

Date

$$4x^2 - \frac{27}{9}x^4 \Big|_0^{x_2} = Cx \Big|_0^{x_2}$$

$$4x^2 - \frac{27}{9}x^4 \Big|_0^{x_2} = (8x - 27x^3)x \Big|_0^{x_2}$$

$$4x_2^2 - \frac{27}{9}x_2^4 = 8x_2^2 - 27x_2^4$$

$$\frac{81}{9}x_2^4 = 4x_2^2$$

$$81x_2^4 = 16x_2^2$$

$$x_2^2 = 16/81$$

$$x_2 = \pm 4/9$$

$$C = 8x - 27x^3$$

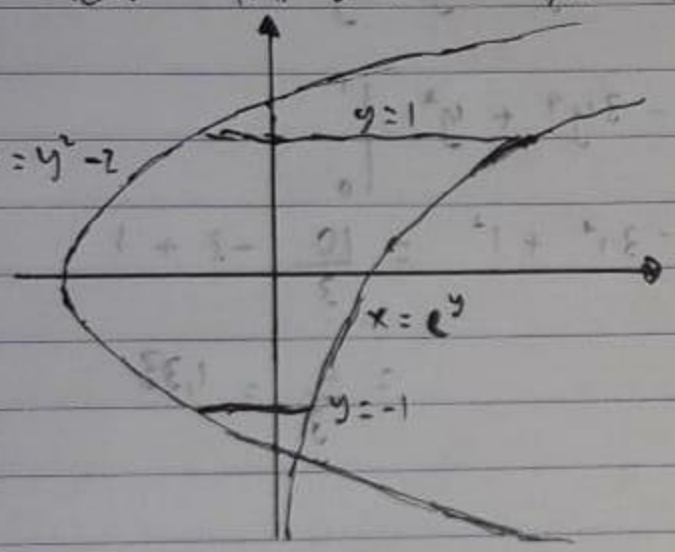
$$C = 8(4/9) - 27(4/9)^3$$

$$C = \frac{32}{9} - \frac{27 \cdot 64}{729}$$

$$C = \frac{32}{9} - \frac{64}{27} = \frac{32}{27}$$

$$C = \frac{32}{27}$$

4. Tentukan luas dari area berikut



$$L = \int_{-1}^{1} (e^y - (y^2 - 2))\, dy = \int_{-1}^{1} e^y - y^2 + 2\, dy$$

$$= e^y - \frac{1}{3}y^3 + 2y \Big|_{-1}^{1}$$

$$= \left(e - \frac{1}{3} + 2\right) - \left(\frac{1}{e} + \frac{1}{3} - 2\right)$$

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

$$\approx 5.6837$$