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Quiz 2

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3. Tipot 2 fx

$y_1 = y_2$

$\frac{1}{4}x^2 = \left(\frac{1}{2}x\right)^{1/2}$

$x^4 = 16 \cdot \frac{1}{2}x$

$x^4 = 8x$

$\frac{x^4}{x} = 8$

$x^3 = 8 \rightarrow x = 2$

Tipot $y_1 = \frac{1}{4}x^2$ $y_2 = 0$

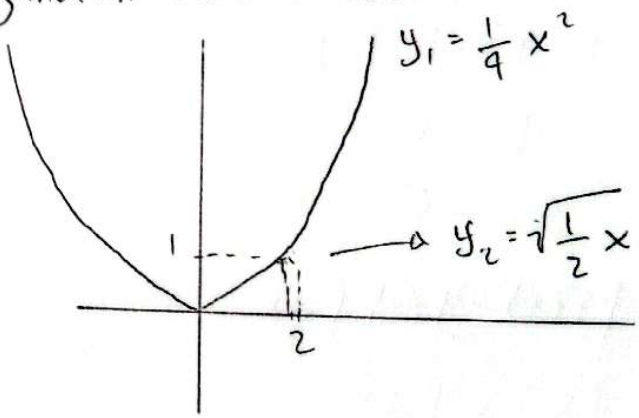
$y_1 = 1$

$x_1 = \sqrt{4y}$

$= 2\sqrt{y}$

$x_2 = 2y^2$

Menggunakan metode cakram



$\rightarrow V = \pi r^2$ $\Rightarrow x_1 - x_2$

$= 2\sqrt{y} - 2y^2$

$V = \pi \int_{y_2=0}^{y_1=1} 2\sqrt{y} - 2y^2 \, dy$

$= \pi \int_0^1 2y^{1/2} - 2y^2 \, dy$

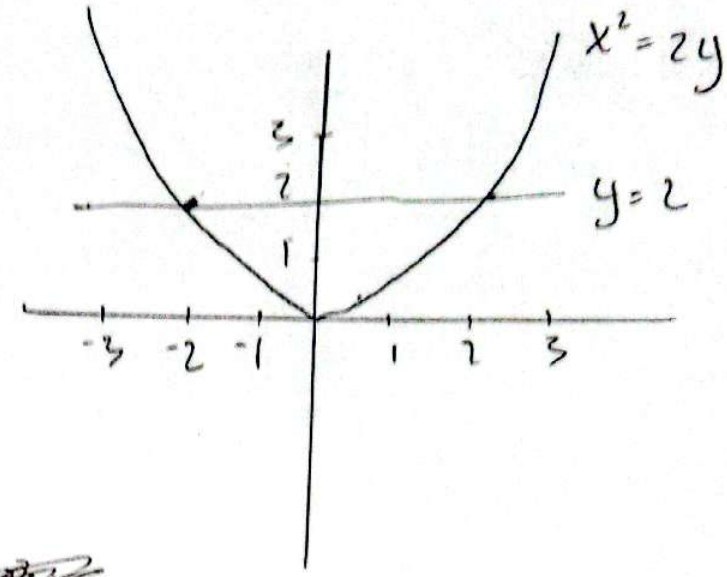
$= \pi \left| \frac{2}{3} 2y^{3/2} - \frac{2}{3} y^2 \right|_0^1$

$= \pi \left(\frac{4}{3} 1^{3/2} - \frac{2}{3} 1^3 - 0 \right)$

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

Dipindai dengan CamScanner

2. Dapatkan titik berat bidang datar dibatasi kurva $x^2 = 2y$ dan garis $y = 2$



⇒ Titik Potong $Y_1 = Y_2$

$\frac{x^2}{2} = 2$

$x^2 = 4$

$x = \pm 2$

$x = -2 \;, x = 2$

⇒ Sumbu simetri $= Y = \frac{1}{2}x^2$

$x = -\frac{b}{2a} = -\frac{0}{2 \cdot \frac{1}{2}} = 0$

⇒ [illegible]

⇒ titik puncak

$y(0) = \frac{1}{2}(0)^2 = 0$

⇒ $M = \int_{-2}^{2} (y_1 - y_2)\, dx$

$= \int_{-2}^{2} (2 - \frac{1}{2}x^2)\, dx$

$= \int_{-1}^{2} 2 - \frac{1}{2}x^2\, dx$

$= [2x - \frac{1}{6}x^3]\Big|_{-2}^{2}$

$= [(4 - \frac{8}{3}) - (-4 + \frac{8}{3})]$

$= [8 - \frac{8}{3}]$

$= \frac{16}{3}$

⇒ $M_x = \int_{-2}^{2} (y_1^2 - y_2^2)\, dx$

$= \int_{-2}^{2} (2^2 - (\frac{1}{2}x^2)^2)\, dx$

$= \int_{-2}^{2} 4 - \frac{1}{4}x^4\, dx$

⇒ $[4x - \frac{1}{20}x^5]\Big|_{-2}^{2}$

$[(8 - \frac{8}{5}) - (-8 + \frac{8}{5})]$

$[16 - \frac{16}{5}] = \frac{64}{5}$

⇒ $M_y = \int_{-2}^{2} x\,(y_1 - y_2)\, dx$

$= \int_{-2}^{2} x\,(2 - \frac{1}{2}x^2)\, dx$

$= \int_{-2}^{2} 2x - \frac{1}{2}x^2\, dx$

$= [x^2 - \frac{1}{8}x^4]\Big|_{-2}^{2}$

$= [(4-2) - (4-2)]$

$= 0$

⇒ Hasil

$\bar{x} = \frac{M_y}{M} = \frac{0}{\frac{16}{3}} = 0$

$\bar{y} = \frac{M_x}{M} = \frac{\frac{64}{5}}{\frac{16}{3}} = \frac{12}{5}$

Titik berat:

$z(\bar{x}, \bar{y})$

$z(0, \frac{12}{5})$

Dipindai dengan CamScanner

9. $y = x^3$ $\quad y = 2x - x^2$

Luas dataran di kuadran I

Titik potong kurva

$x^3 = 2x - x^2$

$x^3 + x^2 - 2x = 0$

$x(x^2 + x - 2) = 0$

$x(x+2)(x-1) = 0$

$x = 0 \quad x = -2$ (Tidak memenuhi) $x = 1$

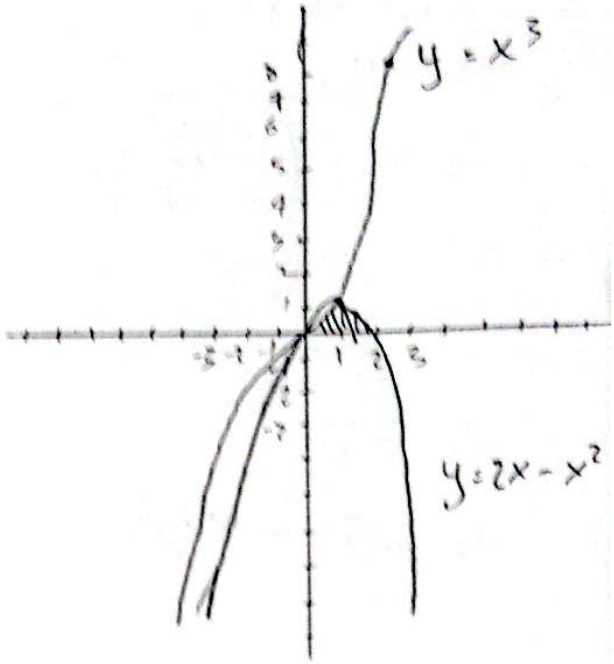
$x = 0, \quad 0^3 = 2.0 - 0^2$

$= 0 \ (0,0)$

$x = 1, \quad 1^3 = 2.1 - 1^2$

$1 = 1$

$= 0 \ (1,0)$



$$L_1 = \int_a^b [f(x) - g(x)]\,dx$$

$$= \int_0^1 [x^3 - x]\,dx$$

$$= \left[\frac{1}{4}x^4 - \frac{1}{2}x^2\right]_0^1$$

$$= \left(\frac{1}{4}(1)^4 - \frac{1}{2}(1)^2\right) - \left(\frac{1}{4}(0)^4 - \frac{1}{2}(0)^2\right)$$

$$= \left(\frac{1}{4} - \frac{1}{2}\right) - (0) = -\frac{1}{4} = \frac{1}{4}$$

$$L_2 = \int_1^2 [2x - x^2 - x]\,dx$$

$$= \left[x^2 - \frac{1}{3}x^3 - \frac{1}{2}x^2\right]_1^2$$

$$= \left(2^2 - \frac{1}{3}2^3 - \frac{1}{2}2^2\right) - \left(1^2 - \frac{1}{3}\cdot 1^3 - \frac{1}{2}\right)$$

$$= \left(4 - \frac{8}{3} - 2\right) - \left(1 - \frac{1}{3} - \frac{1}{2}\right)$$

$$= -\frac{5}{6} = \frac{5}{6}$$

$$L_{total} = \frac{1}{4} + \frac{5}{6} = \frac{6}{24} + \frac{20}{24} = \frac{26}{24}$$

Dipindai dengan CamScanner

1. $y^2 - 8x + x^2 - 10y + 25 = 0$

$y^2 - 10y + 25 = -x^2 + 8x$

$(y-5)^2 = -x^2 + 8x$

$(y-5)^2 =$

$(y-5)^2 + x^2 - 8x = 0$

$$\begin{array}{r} x \\ x-4 \overline{)\, x^2 - 8x} \\ x^2 \end{array}$$

Dipindai dengan CamScanner