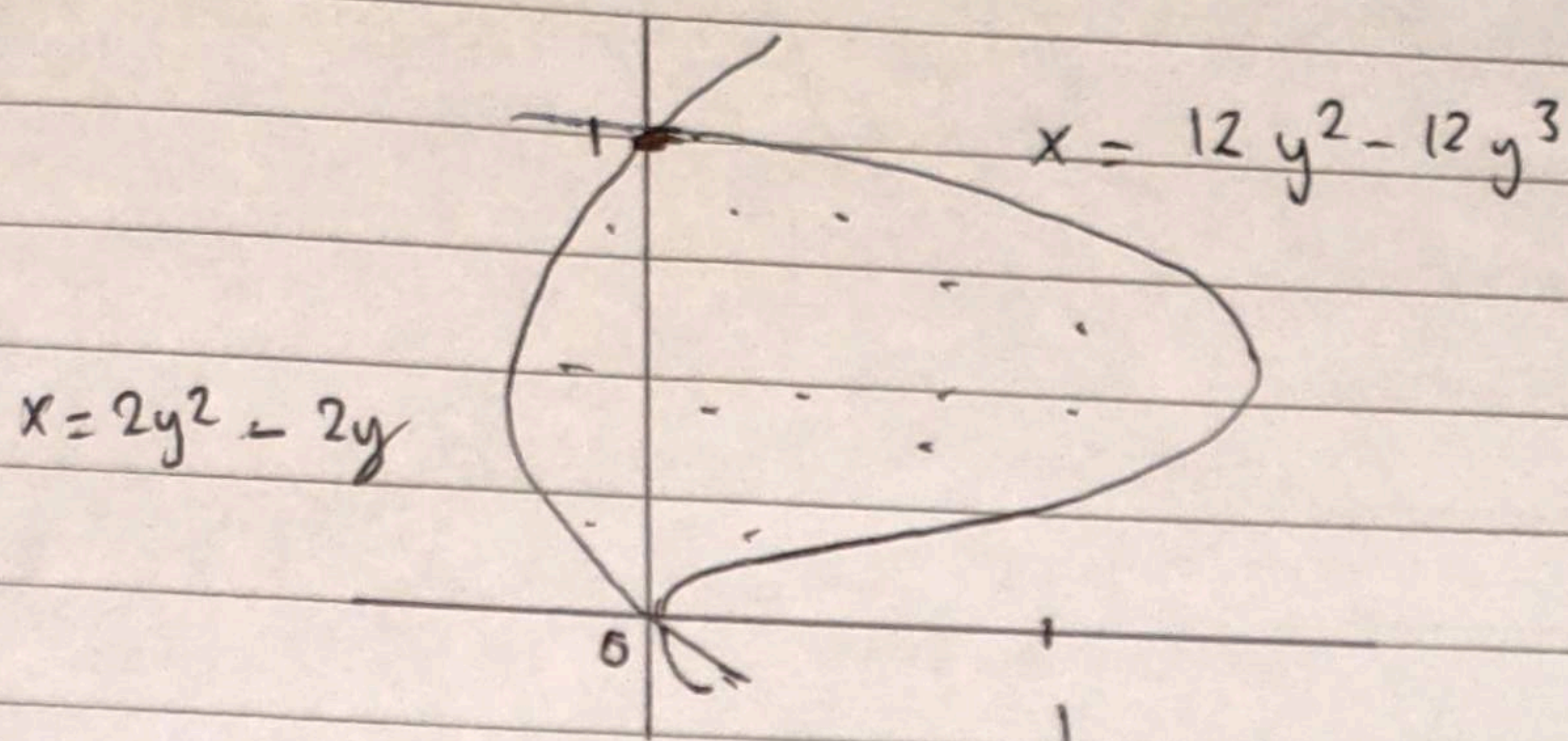


Tugas 1 KVT

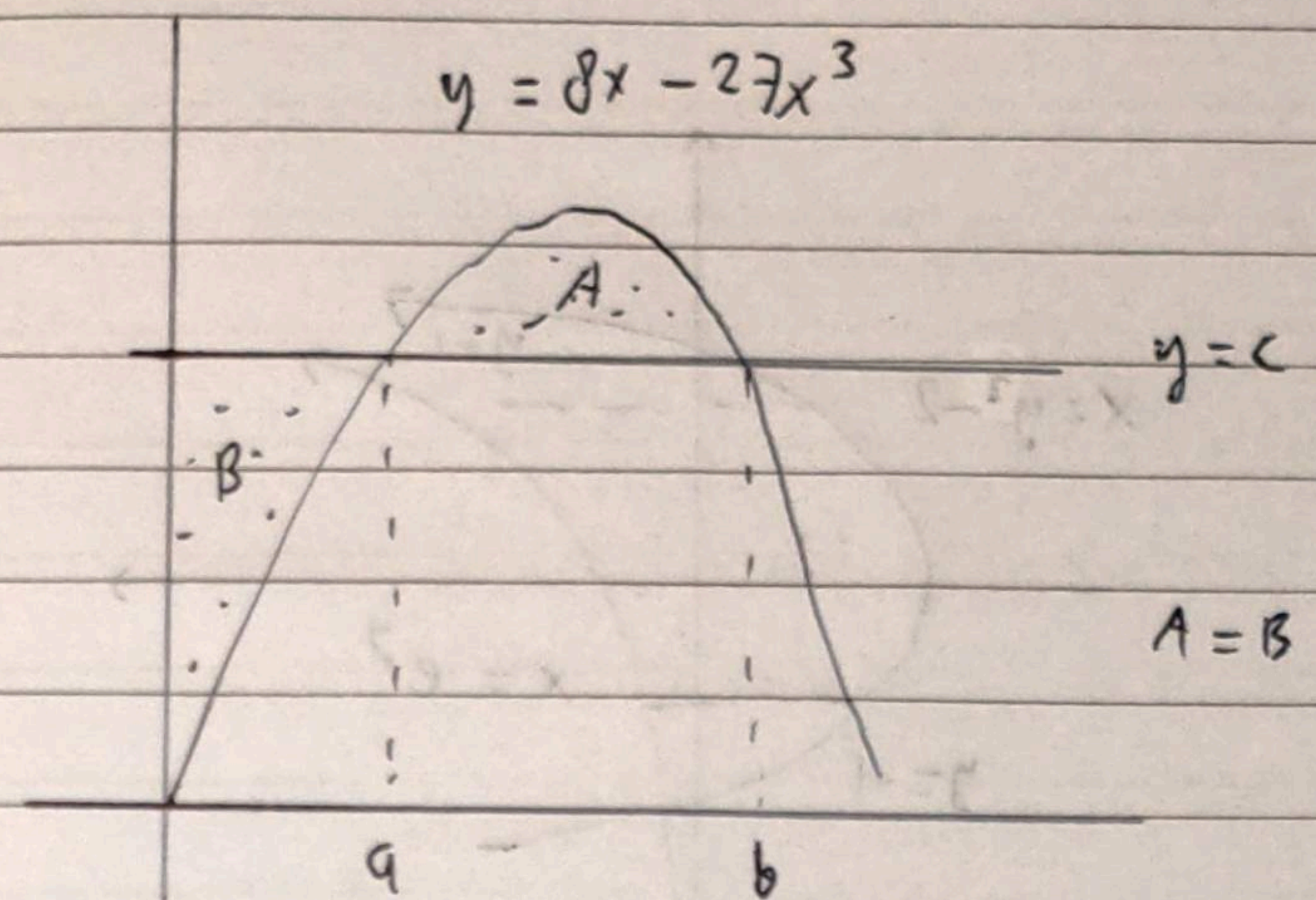
25 September 2021

1 Tentukan luas dari area berikut



$$\begin{aligned} \text{Luas area} &= \int_0^1 (12y^2 - 12y^3 - (2y^2 - 2y)) dy \\ &= \int_0^1 (10y^2 - 12y^3 + 2y) dy \\ &= \left[\frac{10}{3}y^3 - 3y^4 + y^2 \right]_0^1 \\ &= \frac{10}{3} - 3 + 1 = \frac{10-9+3}{3} = \frac{4}{3} \end{aligned}$$

3



Tentukan nilai c

$$\begin{aligned} \int_0^a (c - 8x + 27x^3) dx &= \int_a^b (8x - 27x^3 - c) dx \\ cx - 4x^2 + \frac{27}{4}x^4 \Big|_0^a &= 4x^2 - \frac{27}{4}x^4 - cx \Big|_a^b \\ ca - 4a^2 + \frac{27}{4}a^4 &= 4b^2 - \frac{27}{4}b^4 - cb - 4a^2 + \frac{27}{4}a^4 + ca \\ 4b^2 - \frac{27}{4}b^4 - cb &= 0 \\ &= \frac{11}{4} + \frac{9+1}{4} = 9-1 = \frac{8}{4} = 2 \\ 4b - \frac{27}{4}b^2 - c &= 0 \\ 4b - \frac{27}{4}b^2 &= c \quad \dots i \\ * c &= 8x - 27x^3 \text{ pada titik "b" nilainya sama.} \quad \dots ii \\ c &= 8b - 27b^3 \end{aligned}$$

$$= 4b - \frac{27}{4}b^2 = 8b - 27b^3$$

$$\frac{81b^2}{4} = 4b$$

$$b^2 = \frac{16}{81}$$

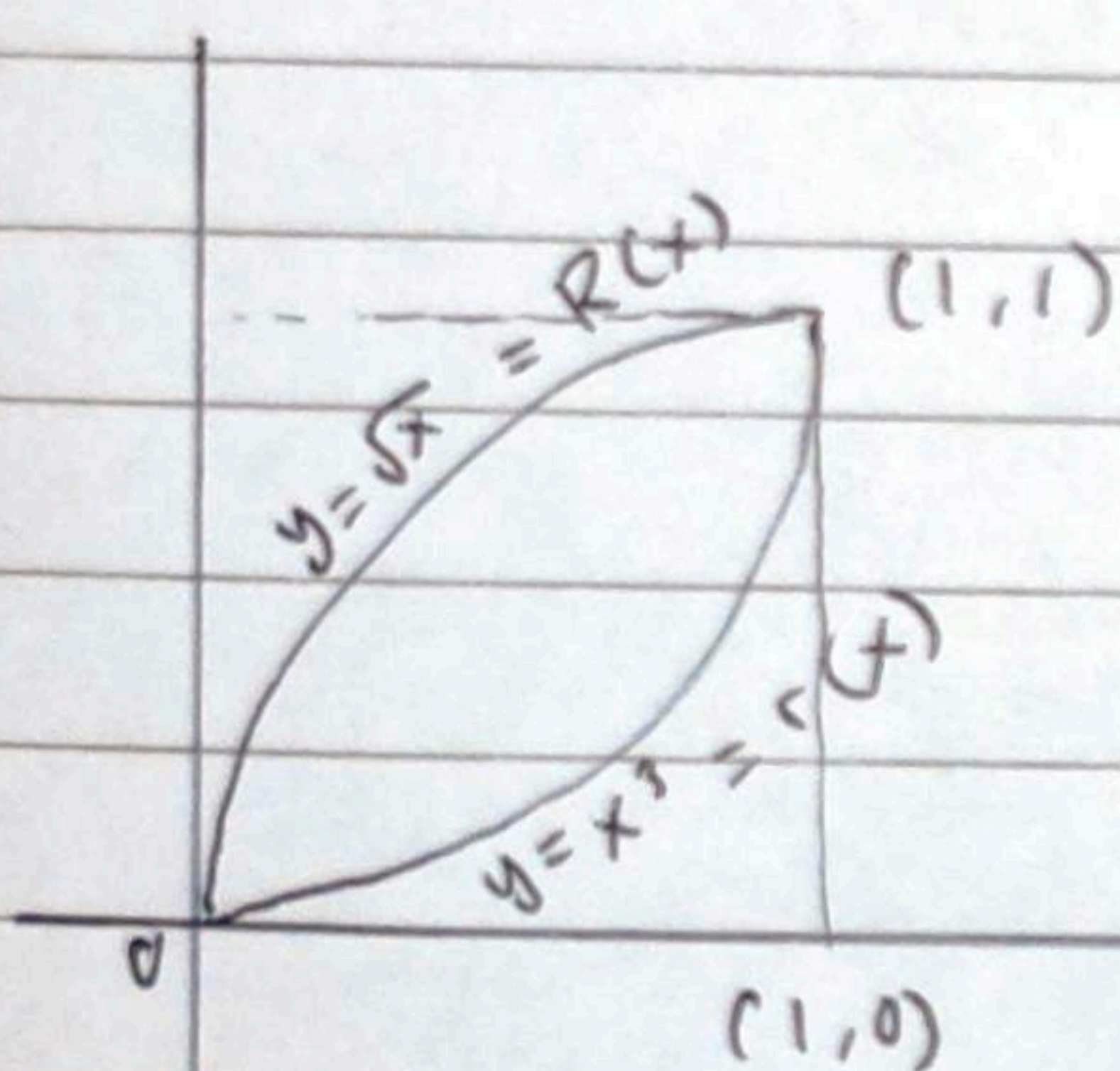
$$b = \frac{4}{9}$$

substitusikan ke persamaan ii

$$* c = 8\left(\frac{4}{9}\right) - 27\left(\frac{4}{9}\right)^3$$

$$c = \frac{32}{27} \approx 1,185$$

2 Tentukan Volume R3



$$\text{Luas area} = \pi (R(x)^2 - r(x)^2)$$

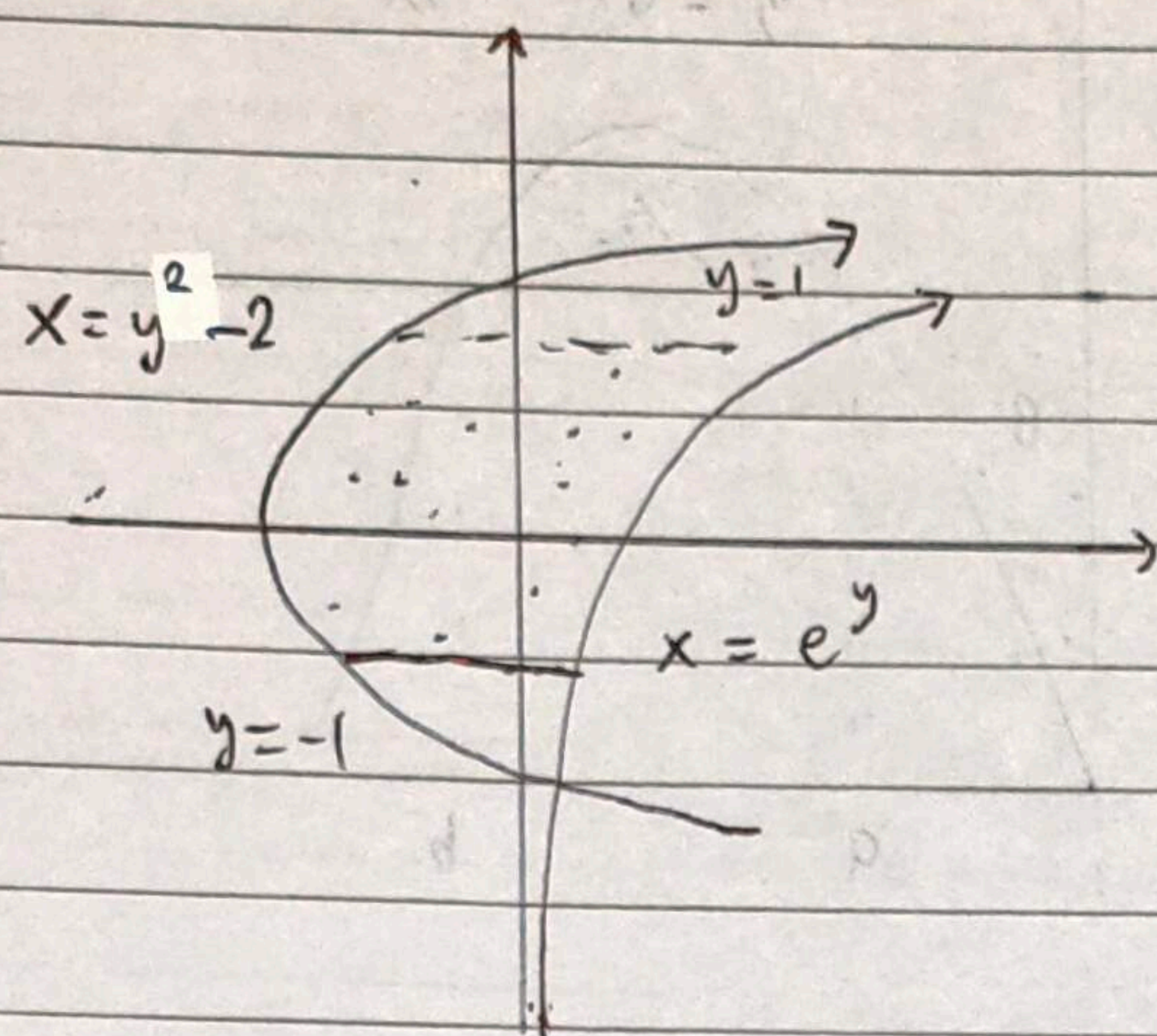
$$\text{Volume benda} = \int_0^1 \pi (R(x)^2 - r(x)^2) dx$$

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

$$= \pi \int_0^1 (x - x^6) dx$$

$$\begin{aligned} &= \pi \left[\frac{1}{2}x^2 - \frac{1}{7}x^7 \right]_0^1 = \pi \left(\frac{1}{2} - \frac{1}{7} \right) \\ &= \pi \frac{7-2}{14} = \frac{5\pi}{14} \end{aligned}$$

Tentukan luas area berikut!



luas area:

$$\begin{aligned} & \int_{-1}^1 (e^y - y^2 + 2) dy \\ &= \left[e^y - \frac{1}{3}y^3 + 2y \right]_{-1}^1 \\ &= e - \frac{1}{3} + 2 - e^{-1} - \frac{1}{3} + 2 \\ &= \frac{e^2 - 1}{e} - \frac{2}{3} + 4 \\ &= \frac{e^2 - 1}{e} + \frac{10}{3} \approx 5,683 \end{aligned}$$