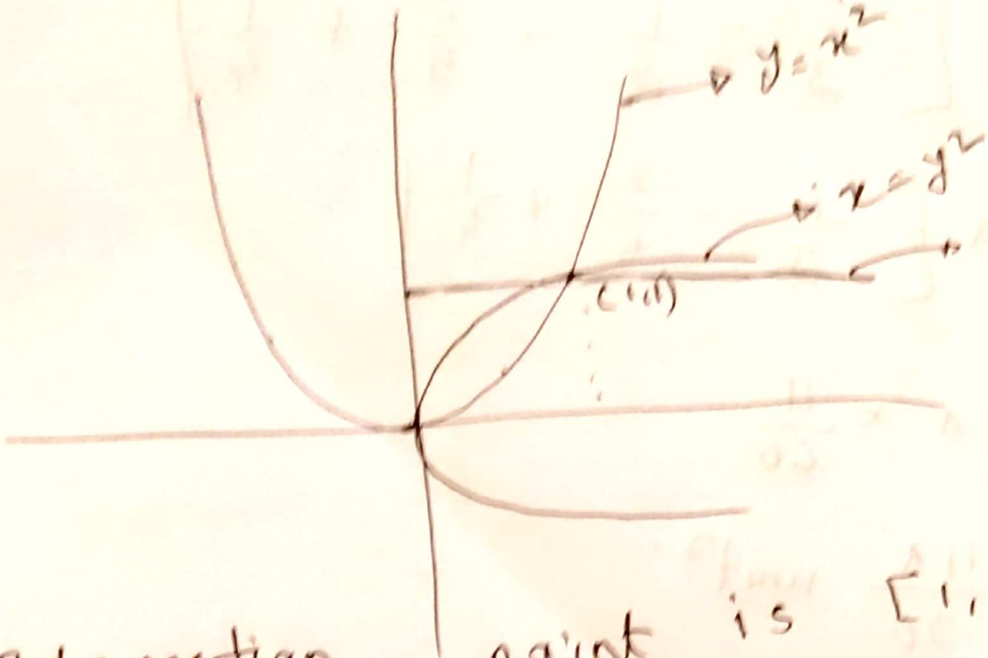
Sub: Quiz-2

1. 

intersection point is [1,1]. and

region is [0,1].

height $h = \sqrt{y} - y^2$. radius $r = (1-y)$

$$V = \int_0^1 2\pi (1-y)(\sqrt{y} - y^2)\,dy$$

$y^{\frac{3}{2}+1}$

$$= 2\pi \int_0^1 (1-y)(\sqrt{y} - y^2)\,dy$$

$$= 2\pi \int_0^1 \sqrt{y} - y^2 - y\sqrt{y} + y^3\,dy$$

$$= 2\pi \left[\frac{y^{\frac{3}{2}}}{\frac{3}{2}} - \frac{y^3}{3} - \frac{y^{\frac{5}{2}}}{\frac{5}{2}} + \frac{y^4}{4} \right]_0^1$$

Scanned with CamScanner

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$$= 2\pi\left[\frac{2}{3} - \frac{1}{3} - \frac{2}{5} + \frac{1}{4}\right]$$

$$= 2\pi\left[\frac{1}{3} - \frac{2}{5} + \frac{1}{4}\right]$$

$$= 2\pi \times \frac{11}{60}$$

$$= \frac{11\pi}{30} \text{ unit}^3.$$

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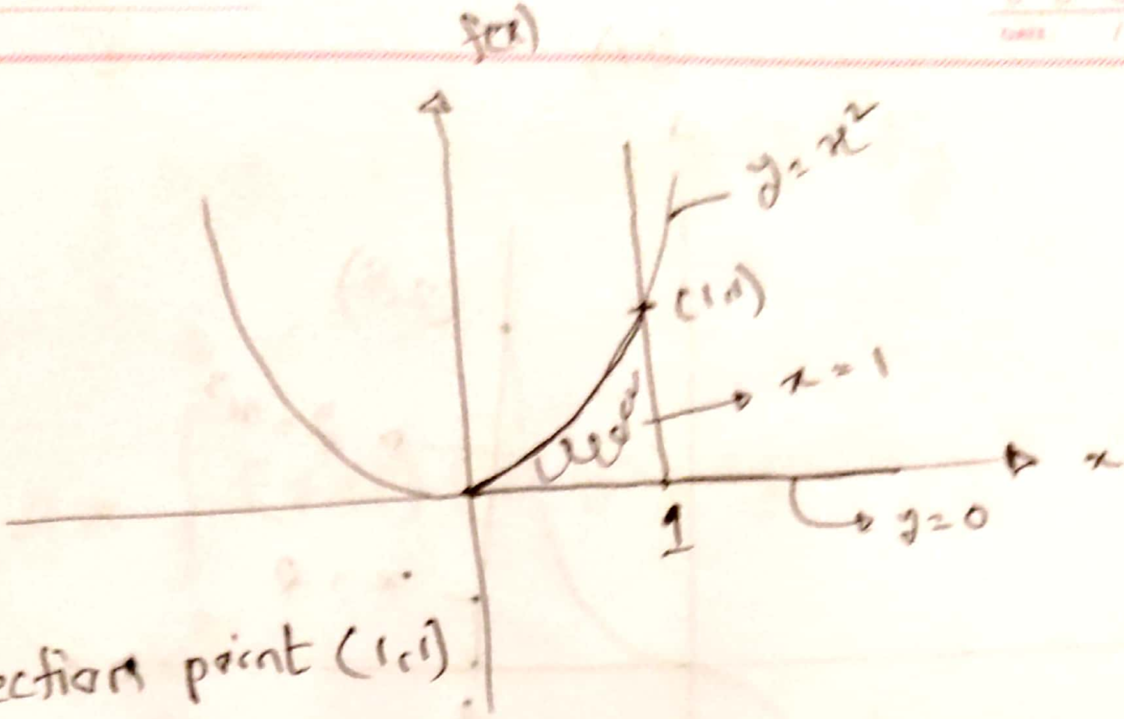

Intersection point (1,1)

Area is $\quad A = \int_0^1 x^2 \, dx$

$$= \left[\frac{x^3}{3}\right]_0^1$$

$$= \frac{1}{3} \text{ unit}^2$$

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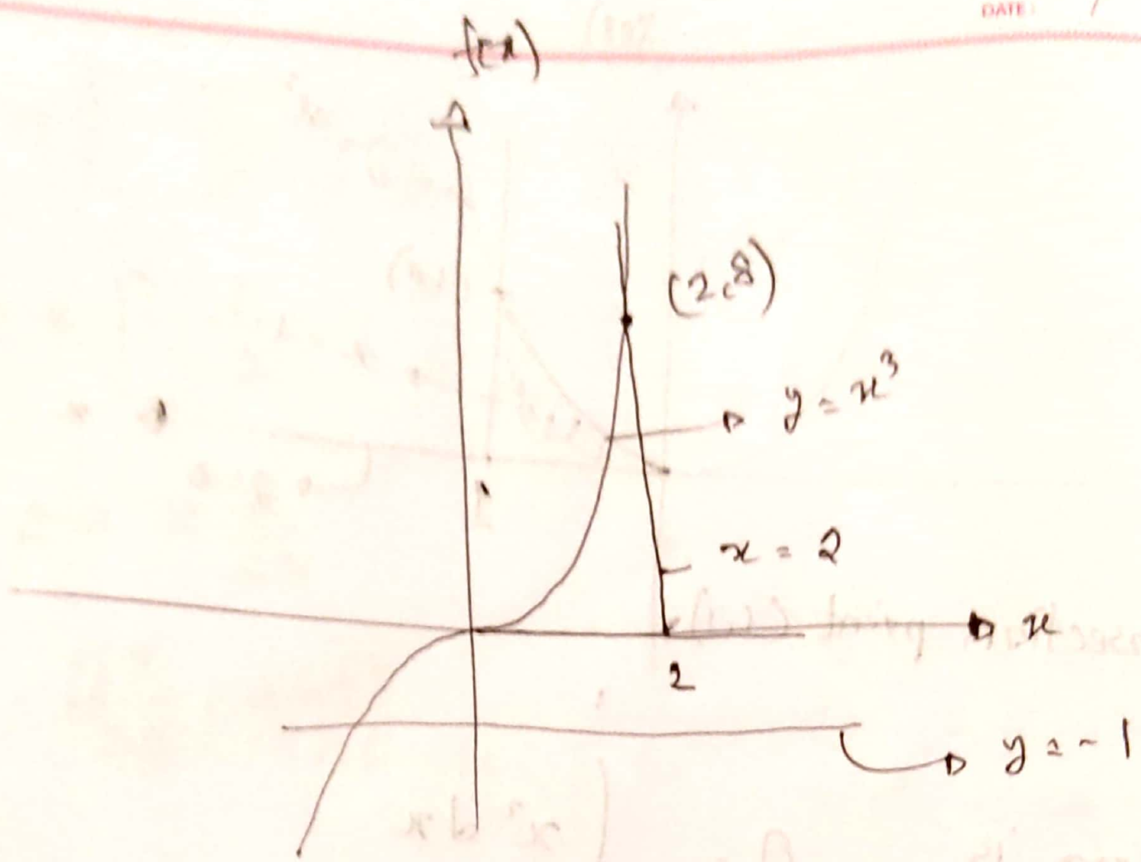
(3)



now. $y = x^3$

$y = (2)^3$

$= 8$

$\therefore$ intersect point is $(x, y) = (2, 8)$

height $= 2 - \sqrt[3]{y}$

radius $= y - (-1) = y + 1$

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$$V = \int_0^8 2\pi (y+1)(2 - y^{\frac{1}{3}})\, dy$$

$$= 2\pi \int_0^8 (y+1)(2 - y^{\frac{1}{3}})\, dy$$

$$= 2\pi \int_0^8 2y - y^{\frac{4}{3}} + 2 - y^{\frac{1}{3}}\, dy$$

$$= 2\pi \left[y^2 - \frac{y^{\frac{7}{3}}}{\frac{7}{3}} + 2y - \frac{y^{\frac{4}{3}}}{\frac{4}{3}} \right]_0^8$$

$$= 2\pi \left[64 - \frac{128}{\frac{7}{3}} + 16 - \frac{16}{\frac{4}{3}} \right]$$

$$= 2\pi \left[64 - \frac{128 \times 3}{7} + 16 - \frac{48}{4} \right]$$

$$= 2\pi \left[64 - \frac{384}{7} + 16 - 12 \right]$$

$$= 2\pi \left[68 - \frac{384}{} \right] = 2\pi \left(\frac{92}{7} \right)$$