• Rasha Shadid

. Name :- - - - - -

Q_1. Find the volume of the solid generated by revolving the region bounded by $y = \sqrt{x}$, $y = 2$, $X = 0$ about

a. X-axis (Shell Method)

b. Y-axis (Disk Method)

c. X = 4 (Shell Method) & (Washer Method)

d. $y = 2$ (Disk Method)

Q_2. Find the volume of the solid generated by revolving the region bounded by $y = \frac{1}{x}$, $y = \frac{1}{2}$, $X = 1$, $X = 2$ (Don't Evaluate Integrals)

1. About X-axis using Washer Method

2. About x-axis using Shell Method

3. About the line X = 2 using Washer Method

4. About the line X = 2 Using Shell Method

5 About the line X = 1 Using Disk Method.

Short Answers:

Q_1 (a) $V = \int_0^2 2\pi (y)(y^2)\, dy = 8\pi$

(b) $V = \int_0^2 \pi (y^2)^2\, dy = \frac{32}{5}\pi$

(c) Shell Method $\quad V = 2\pi \int_0^4 (4-x)(2-\sqrt{x})\, dx = \frac{224\pi}{15}$

Washer Method $\quad V = \pi \int_0^2 [4^2 - (4-y^2)^2]\, dy = \frac{224\pi}{15}$

(d) $V = \pi \int_0^4 (2-\sqrt{x})^2\, dx = \frac{8\pi}{3}$

Q_2. (1) $V = \pi \int_1^2 \left[\left(\frac{1}{x}\right)^2 - \left(\frac{1}{2}\right)^2\right] dx$

(2) $V = 2\pi \int_{1/2}^1 (y)\left(\frac{1}{y}-1\right) dy$

(3) $V = \pi \int_{1/2}^1 \left[(1)^2 - \left(2-\frac{1}{y}\right)^2\right] dy$

(4) $V = 2\pi \int_1^2 (2-x)\left(\frac{1}{x}-\frac{1}{2}\right) dx$

(5) $V = \pi \int_{1/2}^1 \left(\frac{1}{y}-1\right)^2 dy$