

Volumen 1^{ra} parte

13. $y = 1 + \sec x$, $y = 3$ y $\sec x$ d c $y = 1$

$$\sec(y-1) = x \quad y=3, y=2$$

$$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \pi ((1-3)^2 + (1-(1+\sec x))^2) dx$$

$$\int_0^{\pi} \pi (-4 + \sec^2 x) dx$$

$$8(-4x + \tan x) \Big|_0^\pi$$

$$8\pi(-4\pi + \tan \pi) = 4\pi^2$$

15. $y = x^3$, $y = 0$; $x=1$ alrededor de $x=2$

$$\begin{aligned}
 x^3 = 0 &\Rightarrow x = 0, x = 1 \rightarrow [2-x^3] \\
 \Rightarrow \int_0^1 \pi(2-x^3)^2 dx &= \int_0^1 \pi(4-4x^3+x^6) dx \\
 \left[\pi \left(4x - x^4 + \frac{x^7}{7} \right) \right]_0^1 &= \pi \left(4(1) - (1)^4 + \frac{(1)^7}{7} \right) = \pi \left(4 - 1 + \frac{1}{7} \right) \\
 &= \pi \left(3 + \frac{1}{7} \right) = \pi \left(\frac{22}{7} \right) = \boxed{\frac{22\pi}{7}}
 \end{aligned}$$

(70)

FOLIO

AÑO

MES

DIA

MES

AÑO

FOLIO

7.

$$x = y^2, \quad x = 1 - y^2; \quad x \geq 3 \in \text{área de}$$

$$x^2 = y, \quad \sqrt{x+1} = y$$

$$x = -1, 1$$

 \int_1^1

$$\int_{-1}^1 \pi ((3-x)^2 + (3-\sqrt{1-x})^2) dx$$

 \int_1^1

$$\int_{-1}^1 \pi (9 - 6x^2 + x^4 + 9 - 6\sqrt{1-x} + (-x)) dx$$

 \int_1^1

$$\int_{-1}^1 \pi (19 + x^4 - 6x^2 - x - 6\sqrt{1-x}) dx$$

$$\begin{aligned} &\int \sqrt{1-x} dx \\ &\int -\frac{1}{2} u^{-\frac{1}{2}} du \end{aligned}$$

$$= \pi \left(19x + \frac{x^5}{5} - 2x^3 - \frac{x^2}{2} + 4(1-x)^{\frac{3}{2}} \right) \Big|_{-1}^1$$

$$= \pi \left[\left(19 + \frac{1}{5} - 2 - \frac{1}{2} \right) - \left(19 - \frac{1}{5} + 2 - \frac{1}{2} + 4\sqrt{2} \right) \right]$$

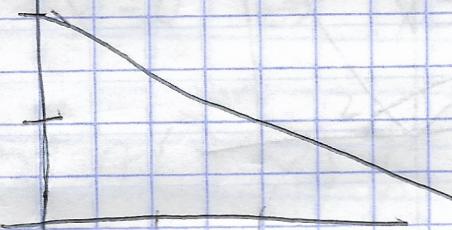
$$= \pi \left[\left(17 - \frac{3}{10} \right) - \left(-17 - \frac{7}{10} + 4\sqrt{2} \right) \right]$$

$$= \pi \left[17 - \frac{3}{10} + 17 + \frac{7}{10} - 4\sqrt{2} \right] = \pi \left[34 + \frac{2}{5} - 4\sqrt{2} \right]$$

$$= \pi \left[\frac{172}{5} - \frac{40\sqrt{2}}{5} \right] = \boxed{\pi \left[\frac{172 - 40\sqrt{2}}{5} \right]}$$

FOLIO		AÑO	MES	DIA	MES	AÑO	FOLIO
-------	--	-----	-----	-----	-----	-----	-------

$y = 2 - \frac{1}{2}x$ $y=0$ $x=1$, $x=2$ $z=1$



$$\int_1^2 \pi [2 - \frac{1}{2}x]^2 dx$$

$$= \int_1^2 \pi [4 - 2x + \frac{1}{4}x^2] dx$$

$$= 4\pi x - \pi x^2 + \frac{x^3}{12}\pi \Big|_1^2$$

$$= [8\pi - 4\pi + \frac{8}{12}\pi] - [4\pi - \pi + \frac{1}{12}\pi]$$

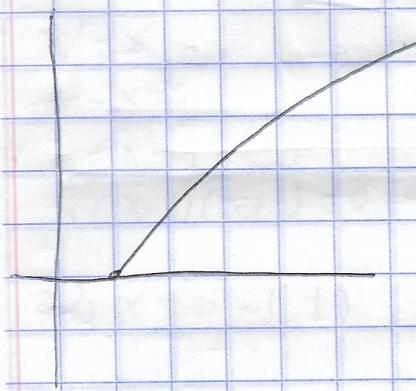
$$= 4\pi + \frac{3}{12}\pi - 3\pi$$

$$= \pi + \frac{1}{4}\pi$$

$$= \frac{19}{12}\pi$$

FOLIO	AÑO	MES	DIA	DIA	MES	AÑO	FOLIO

3. $y = \sqrt{x-1}$, $y=0$, $x=5$; alrededor del eje x

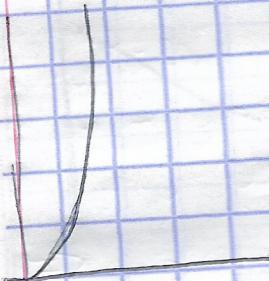


$$\begin{aligned}
 & \int_1^5 \pi (\sqrt{x-1})^2 dx = \int_1^5 \pi (x-1) dx \\
 & = \pi \int_1^5 (x-1) dx = \pi \left[\frac{x^2}{2} - x \right] \Big|_1^5 \\
 & = \pi \left[\left(\frac{25}{2} - 5 \right) - \left(\frac{1}{2} - 1 \right) \right] \\
 & = \pi \left[\frac{24}{2} - 4 \right] \\
 & = \pi [12 - 4] \\
 & = \pi 8
 \end{aligned}$$

DIA	MES	AÑO	FOLIO

5. $x = 2\sqrt{y}$ $x=0$ $y=9$

$y = 0, 9$



$$\int_0^9 \pi (2\sqrt{y})^2 dy$$

$$= \pi 4 \int_0^9 y dy = \pi 4 \left[\frac{y^2}{2} \right] \Big|_0^9$$

$$= 2\pi [9^2 - 0^2]$$

$$= 2\pi [81]$$

$$\boxed{= 162\pi}$$

FOLIO	AÑO	MES	DIA	DIA	MES	AÑO	FOLIO
-------	-----	-----	-----	-----	-----	-----	-------

7. $y = x^3$ $y = x$ $x \geq 0$

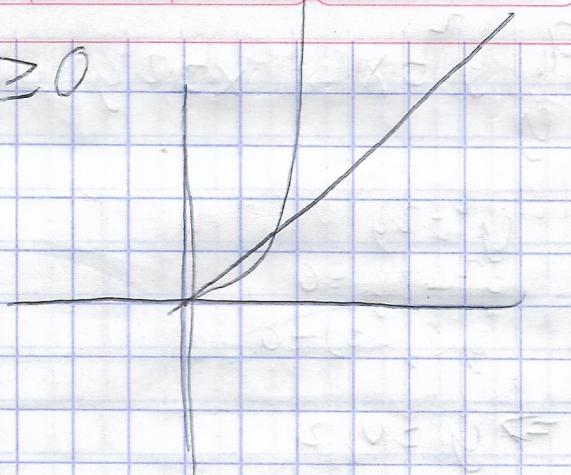
$$x^3 = x$$

$$x^3 - x = 0$$

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

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

$$\Rightarrow (x=0, -1, 1)$$



$$\begin{aligned} & \pi \int_0^1 [(x^3)^2 - x^2] dx \\ &= \pi \int_0^1 [x^6 - x^2] dx \\ &= \pi \left[\frac{x^7}{7} - \frac{x^3}{3} \right] \Big|_0^1 \\ &= \pi \left[\frac{1}{7} - \frac{1}{3} \right] = 0 \end{aligned}$$

$$= \pi \left[-\frac{4}{21} \right]$$

$$= -\frac{4}{21} \pi$$

CLAVE	FECHA			DIA	MES	AÑO	FOLIO

a. $y = x$ $x = 2y$ \Rightarrow $y^2 = 2y$ \Rightarrow $y = 0, 2$ \Rightarrow $y = 2$ \Rightarrow $x = 4$



$$y^2 = 2y$$

$$y^2 - 2y = 0$$

$$y(y-2) = 0$$

$$\Rightarrow y = 0, 2$$

$$\int_0^2 \pi ((y^2)^2 - (2y)^2) dy$$

$$= \int_0^2 \pi (y^4 - 4y^2) dy$$

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

$$= \pi \left[\frac{32}{5} - \frac{32}{3} \right]$$

$$= \pi \left(\frac{96}{15} - \frac{160}{15} \right)$$

$$= \pi \left(-\frac{64}{15} \right)$$

FOLIO	ANO	MES	DIA	DIA	MES	ANO	FOLIO

II. $y = x^2 \quad x = y^2 \quad$ alrededor de $y = 1$

$$y = x^2 \quad \sqrt{x} = y$$

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

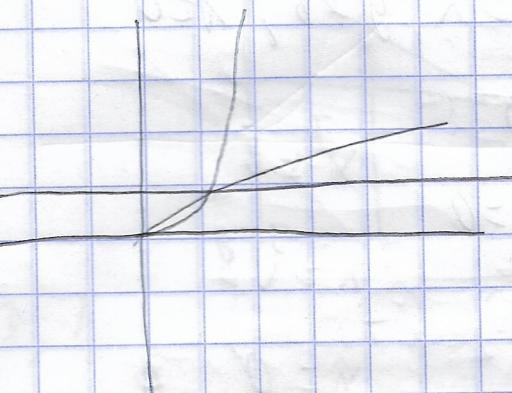
$$x^4 = x$$

$$x^4 - x = 0$$

$$x(x^3 - 1) = 0$$

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

$$\Rightarrow x = 1, 0$$



$$y(x) = 1 - x^2$$

$$f(x) = 1 - \sqrt{x}$$

III

$$\int_0^1 \pi [-(1-\sqrt{x})^2 + (1-x^2)^2] dx$$

$$= \pi \int_0^1 (1 - 2x + x^4 - 1 + 2\sqrt{x} + x^2) dx$$

$$= \pi \int_0^1 (x^4 + 2\sqrt{x} - x^2) dx$$

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

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

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

$$= \pi \left[\frac{9}{5} \right]$$