Find the area between $X + 4y^2 = 4$ and $x + y^4 = 1$ for $0 \le X$.

We Find the intersection $(4-4y^2) + y^4 = 1$

So $y^4 - 4y^2 + 3 = 0$

$(y^2-3)(y^2-1) = 0$

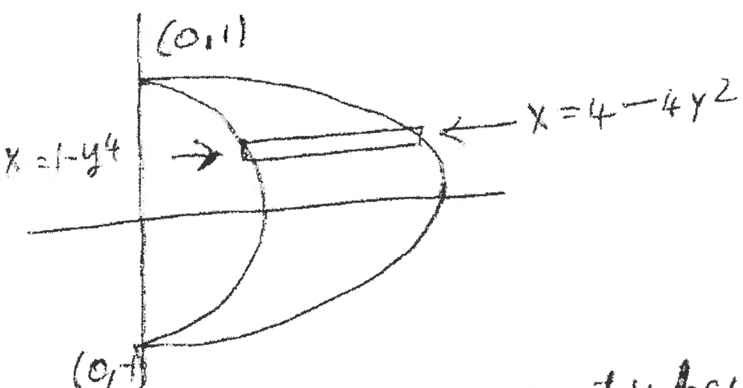
$y^2 = 3$ or $y^2 = 1$

When $y^2 = 1$, the $X = 0$

whe $y^2 = 3$, the $X = -8$

The two curves have 4 Points of intersection $(0,1), (0,-1), (-8,\sqrt{3})$ and $(-8,-\sqrt{3})$

Our picture looks like



The rectangle with y-coordinate y has area $\left[(4-4y^2) - (1-y^4)\right] dy$

The region has area

$$\int_{-1}^{1} (3 - 4y^2 + y^4)\, dy$$

$$= 3y - \frac{4y^3}{3} + \frac{y^5}{5} \Big]_{-1}^{1}$$

$$= \boxed{2\left(3 - \frac{4}{3} + \frac{1}{5}\right)} = \frac{2(45-20+3)}{15} = \frac{56}{15}$$