Cálculo II
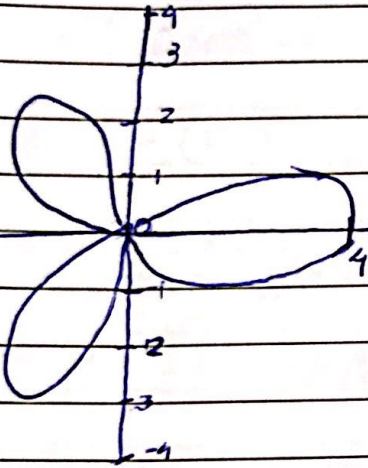
$a \cdot r = 4 \cos (3\theta)$

$r = 0 \to 4 \cos (3\theta) = 0$

$3\theta = \cos^{-1} 0 = \left(\dfrac{\pi}{2}\right) + \pi \cdot n$

$\theta = \left(\dfrac{\pi}{6}\right) + \left(\dfrac{\pi}{3}\right) n$

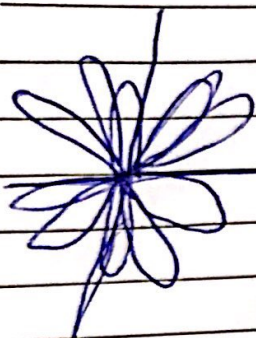Limite de Integração $= \left(\dfrac{\pi}{6}\right)$ e $-\left(\dfrac{\pi}{6}\right)$

$A = \displaystyle\int r^2 \, d\theta = \dfrac{1}{2} \int (16 \cos^2 (3\theta)) = 8 (\cos^2 (3\theta))$

Integral I $= 4 \, d\theta = 4 (\pi/6) - (-\pi/6) = 4 \left(\dfrac{\pi}{3}\right)$

Integral II $= 4 \cos = \left(\dfrac{2}{3}\right) \text{sen} (v) = \left(\dfrac{4}{3}\right) \cdot \pi$

b - r = sen (4θ)

$r = 0 \rightarrow$ sen $4\theta = 0$

$4\theta =$ sen$^{-1} 0 = \pi \cdot n$

$\theta = \dfrac{\pi}{4} n$

Limites de Integração $\rightarrow$ (0) e $\left(\dfrac{\pi}{4}\right)$

$A = \dfrac{1}{2} \displaystyle\int r^2 \, d\theta = \dfrac{1}{2} \displaystyle\int (\text{sen}^2 \, 4\theta)$

Integral ① $= \dfrac{1}{4} \bigg/ (\pi/4) - 0 = \dfrac{\pi}{16}$

Integral ② $= \dfrac{1}{4} \displaystyle\int \cos u \, (du/8) = \dfrac{1}{32} \text{sen} \left(\dfrac{1}{16}\right) \pi$