Polar. 4.3 +(0)= (x= 1 cm ) y= 1 sino 1=fros N= Vx2+y2 Q = Fan Z (x,y) -s (x,o)ay & TR (r, one)? no(p? -35/1€2 O=# 12000=2 = X=2 12 Cs & sind = 4 (raso) (rsino) = 4 X 7 = 4 7 = 1- Coso パニアールのの x2+y2= Vx25y2 - X x4+y4+ 2x2y2+2x3+2xy2-y2=0 0, 1, 2 ) Cos 60° = 1 5, n 30° = 1

(-2,0) Symmetry X-axis  $(\lambda, -\delta)$   $(-\lambda, \overline{u}-\delta)$ 7= f(0) = coso f(-0) = Cos(-0) = Cos(0)Symmetry y-axis (-r, -o) (r, r-o)1 = 5 mo from = 5 m (-0) こ - SMO 二 - 人 Chugin: (-1,0) (n, 11+0) n= 1- Cood from = 1 - coso

11. 4 Calculus  $\frac{dy}{dx} = \frac{dy}{dx} \frac{dy}{dx}$ = fros sui d + fros cord fros coso - fros sino 5x f'(0)= 1- cood = 1 -TISOST  $\frac{dy}{dx} = \frac{\sin^2 \theta}{\sin^2 \theta} + (1 - \cos \theta) \cos \theta$   $\sin^2 \theta + (1 - \cos \theta) \sin^2 \theta$ = sin o - coso + Coso 3 sin o coso - sin o = 1-2 cos d + cos d = 0 sui d (2000 -1) SINO 40 20 0 40 pm), coso + 1  $-2\cos^2\sigma + \cos\sigma + 1 = 0$   $\cos\sigma = 1$   $\cos\sigma = -\frac{1}{2}$ denomination  $\sigma = 0 + \sigma$  $\int_{0}^{\infty} dz \int_{0}^{\infty} dz \int_{$ 

$$\frac{1}{2} = \frac{1}{2} \pi^{2} O \qquad (C \text{ pad})$$

$$= \frac{1}{2} \int_{\alpha}^{\beta} \chi^{2} d\nu$$

$$= \frac{1}{2} \int_{\alpha}^{\beta} \chi^{2} d\nu$$

$$\frac{1}{2} = \frac{1}{2} \int_{\alpha}^{2\pi} \chi^{2} d\nu$$

$$\frac{1}{2} = \frac{1}{2} \int_{0}^{2\pi} \chi^{2} d\nu$$

$$\frac{1}{2} \int_{0}^{2\pi} \chi^{2} d\nu$$

Anea = \frac{1}{2}\int (r\_1^2 - r\_i^2) do out N= 1-cood 11 (cicle)  $(-\cos\phi = 1)$   $\cos\phi = 0$   $\phi = t \mathbf{I}$  $f = \frac{1}{2} \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \left( 1^2 - \left( 1 - \cos \sigma \right)^2 \right) d\sigma$  $=2\left(\frac{1}{2}\right)\int_{0}^{\frac{\pi}{2}}\left(2\cos\phi-\cos^{2}\phi\right)d\phi$ = 1 (2000 - 1 - 1 cos 20) do =  $2 \sin \theta - \frac{1}{2} \theta - \frac{1}{4} \sin \theta d / \frac{\pi}{2}$ =  $2 - \frac{\pi}{4} \quad \text{mid}^2$ 

Length  $L = \int_{-\infty}^{\infty} \sqrt{\Lambda^2 + \left(\frac{ch}{dv}\right)^2} do$ EX L? Z= 1-cood

dr = , sino / 12+ (dr.)2 = /1-2coso + coso + sind = 1/2-2000 sink = 1- coax 251/2=1-coo = Versing 2 sing L = 2 sin & do = - 4 cos d / 24  $= -\alpha(-1-1)$  = 8 um

i programa existântă a programa de la paga paga co

Surface P= 2 11 f(o) s.no / (f(o) + (f(o)) do

polar axis  $\Rightarrow 2\pi \int_{\alpha}^{\alpha} f(\sigma) \cos \sigma \int_{\alpha}^{\alpha} f^{2} + (f')^{2} d\sigma$   $\text{line } \sigma = \frac{\pi}{2}$   $\text{about line } \sigma = \frac{\pi}{2}$ froscoso 1 12 - 1 Cos 20 + 2 in 20
= 1 5 = 20 5 coso do = 17 \( \) (1+ cos 20) do = 17 (0+ 1 sin 20 /

= 17 2 unit 2

Ilt A? I leaf 1= Cos 30  $A = \frac{1}{2} \left( \frac{1}{3} \right) \int_{0}^{2\pi} \cos^{2} 30 \, dv$ = 1/2 (1+cos60) do  $=\frac{1}{12}\left(0+\frac{1}{6}\sin 60\right)$ (03 g = 5 = 1/2 (27) 7 = 1 S ( Cos 230 dd = \frac{1}{4} (2) \int (1+ cos 60) do - 1 (0 + 6 rin 60) / 16

118. A? 
$$R = 4 + 2 + \sin \theta$$
 $4 = \frac{1}{3} \int 4(2 + \sin \theta)^2 d\theta$ 
 $= 2 \int (4 + 4 \sin \theta + \sin^2 \theta) d\theta$ 
 $= 2 \int (\frac{9}{4} + 4 \sin \theta - \frac{1}{3} \cos 2\theta) d\theta$ 
 $= 2 (\frac{9}{4} - 4 \cos \theta - \frac{1}{3} \sin 2\theta) \int_{0}^{2\pi} \frac{1}{2\pi} d\theta$ 
 $= 2(\frac{9}{4} - 4 + 4)$ 
 $= 16 \pi \text{ cum}^2$ 
 $4 = 10 \quad 4? \quad 2^2 = 2 \sin 3\theta$ 
 $4 = \frac{1}{3} \int_{0}^{2\pi} 2 d\theta$ 
 $= (6) \frac{1}{3} \int_{0}^{2\pi} 2 \sin 3\theta d\theta$ 
 $= -4 (0 - 1)$ 
 $= 4 \text{ cm}^2$ 

Condivid. a(1+ cusa)

4.25 N=45120 1 = 4 sin 20 = 2 sui 20 = 1 20 = 1. , 51 U= # 1511 7= = = (16 sin 20 - 4) do 1/2 (8-8 cos 210-4) do  $= 2 \int_{\sqrt{n}}^{\sqrt{n}} (1 - 2\cos \omega \delta) d\omega$   $= 2 \left(0 - \frac{1}{2} \sin \omega \delta \right) \int_{\sqrt{n}}^{\sqrt{n}} d\omega$  $=2\left(\frac{50}{12}+\frac{13}{4}-\frac{10}{12}+\frac{13}{4}\right)$   $=\frac{20}{3}+13$ ナンはない 4 (1 + 2 + 405)

= 2017 + 4 1/3

#18 ,t? N=2000 N= 2 suid 1 = 2 cos v = 2 sin o  $A = 2 \frac{1}{2} \int_{0}^{\sqrt{2}} u \sin^{2} u \, du$   $= 2 \int_{0}^{\sqrt{2}} (1 - \cos 2u) \, du$ = 2 (0 - 1 sin 20 / 2/4  $= 2\left(\frac{\pi}{u} - \frac{1}{2}\right)$   $= \frac{\pi}{2} - (uu'')^2$ 

5in 30