sare dis

som pt.

13.2 -

3 r, (+)= (2-4+,1,1++)



Y: |= |+S =) S = 0

 $\pm: 1+\frac{3}{2} \neq 5$  No intersection

V2(s)= <-4+25, 1+5,5-25>

x: 2-4+=-4+25=-4 = +=6/4=3/2

$$\frac{1}{1} \theta = \cos^{-1} \left( \frac{(3,1,1) \cdot (2,-4,2)}{\sqrt{9+1+1} \cdot \sqrt{4+16+4}} \right) = \cos^{-1} \left( \frac{6-4+2}{\sqrt{11}\sqrt{24}} \right) = \cos^{-1} \left( \frac{4}{\sqrt{264}} \right)$$

1/wt + Hutt cos Ov, w

V2 Hott

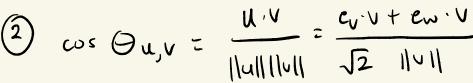
1+ cos 0 V,W

1/4/1/1 JZ HOW

= 1+ cus Qu, w = cus Qu, v /

COS Qu, w = WW = Hall cos Qv, w + Hart

J2



3) No, 
$$f_i = x$$
 i. $k = j$ . $k = 0$ 
but  $i \neq j$ 

$$\frac{1}{2} \left( \frac{1}{2} \right) \left( \frac{1}{2} \right) = \frac{1}{2} \left( \frac{1}{2} \right) \left( \frac{1}{2} \right)$$

2) 
$$[x] = K, j \times K = i, K \times i = j$$

3)  $|u \cdot (v \times w)| = \begin{vmatrix} 2 & 2 & 1 \\ 1 & 0 & 3 \\ 0 & -4 & 0 \end{vmatrix}$ 

$$= 4 \begin{vmatrix} 2 & 1 \\ 1 & 3 \end{vmatrix} = 4 \begin{pmatrix} 6-1 \end{pmatrix} = \boxed{20}$$

$$4 - 3 + 2 = 3$$

$$2 + 3y + 2z = 3$$

$$PQ = (-1,2,-3)$$

$$PR = (1,2,-6)$$

$$PQ < PR = \begin{vmatrix} 1 & 2 & -3 \\ 1 & 2 & -6 \end{vmatrix}$$

$$= i(-12+6)-j(6+3) + k(-2-2)$$

-6-9-4= b = -19

= -6i - 9i - 4k = (-6, -9, -4)

Pluj : (1,41) =>

13.5

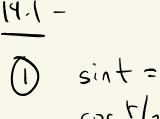
1) x + 3y + 27 = &

$$\frac{-6x-9y-42=-19}{3r(t)=\langle 1,1+2t,4t\rangle}$$

(3) 
$$r(t) = \langle 1, 1+2t, 4t \rangle$$
  
 $1 + 1 + 2t + 4t = 14$ 

$$|+|+2++4+=|4|$$
=>  $6+=|2|$  =>  $+=2$ 

$$1+2++4+=14$$
  
 $5 6 + = 12 = 5 + = 2$   
 $(2) = (1,5,8)$ 



$$\cos t/2 = 0 = ) \stackrel{+}{=} = K \stackrel{+}{=}$$

Ves, when  $+ is$  a multiple of  $\pi$ 

vadius: 12

center: (7,0,0)

$$\frac{dr_{1}}{dt} = (2t, 3t^{2}, 1)$$

$$\frac{dr_{2}}{dt} = (3e^{3t}, 2e^{2t}, et)$$

$$a. \frac{dv_{1}}{dt} \cdot v_{2} + r_{1} \cdot \frac{dv_{2}}{dt}$$

$$= 2te^{3t} + 3t^{2}e^{2t} + e^{t} + 3t^{2}e^{3t} + 2t^{2}e^{2t} + e^{t}$$

$$= (2t + 3t^{2})e^{3t} + (3t^{2} + 2t^{3})e^{2t}$$

$$+ (1+t)e^{t}$$

$$6. \left\{t^{3}e^{t} + 3t^{2}e^{t} - 2te^{t} - 2te^{t}$$

$$3te^{3t} + e^{3t} - t^{2}e^{t} - 2te^{t}$$

$$2t^{2}e^{2t} + 2te^{2t} - 3t^{2}e^{3t}$$

(2) 
$$\int_{-2}^{2} \langle t^{2} + 4t, 4t^{3} - t \rangle dt$$
  
 $= \langle 2t + 4, 12t^{2} - 1 \rangle \Big|_{-2}^{2}$ 

$$\frac{14.3}{0} - \frac{14.3}{0} - \frac{14}{0} = \int_{0}^{4} || \langle 2, \frac{1}{+}, 2+ \rangle || d+$$

$$= \int_{1}^{4} \sqrt{4 + \frac{1}{2} + 44^{2}} dt = \int_{1}^{4} \sqrt{\frac{44^{4} + 44^{2} + 1}{4^{2}}} dt$$

- - $= \int_{1}^{4} \sqrt{\frac{(2++1)^{2}}{+^{2}}} \, dt = \int_{1}^{4} \frac{2++1}{t} \, dt$

$$= \int_{1}^{4} 2 + \frac{1}{4} dt = 2t + \ln|t||_{1}^{4}$$

$$= 8 + \ln(8) - 2 - 0 = 6 + \ln(f)$$

$$= \int_{1}^{4} (2u, 4u, 3u^{2}) ||du|$$

$$=\int_0^t \sqrt{4u^2+16u^2+9u^4} du$$

$$= \int_0^t u \sqrt{20 + 9u^2} du$$

$$= \frac{(9u^2 + 20)^{3/2}}{27} \Big|_{0}^{1}$$

$$= \frac{(9+^{2}+20)^{3/2}}{20} - \frac{(20)^{3/2}}{27}$$

(3) a) 
$$s=g(t) = \int_{0}^{t} ||\langle 3, 4, 2 \rangle|| du$$
  
=  $\int_{0}^{t} \sqrt{9+16+4} du = \sqrt{29} +$ 

$$g^{-1} = \frac{s}{\sqrt{2q}}$$

$$r\left(g^{-1}(s)\right) = \left\langle \frac{3s}{\sqrt{2q}} + 1 \right\rangle \frac{4s}{\sqrt{2q}} - s$$

 $\Gamma\left(g^{-1}(s)\right) = \left\langle \frac{3s}{\sqrt{2n}} + 1, \frac{4s}{\sqrt{2n}} - s, \frac{2s}{\sqrt{2n}} \right\rangle$ 

$$|s=g(t)| = \int ||s| ds = \frac{1}{2} ||s| ds = \frac{1}{$$

$$\frac{t}{(\cos^2 + 2\cos^2 + \sin^2 + \sin^2$$

$$\int_{0}^{t} e^{n} \sqrt{3} du = \sqrt{3} e^{u} \Big|_{0}^{t} = \sqrt{3} e^{t} - \sqrt{3}$$

$$S + \sqrt{3} = \sqrt{3} e^{t} = 0 + = \ln\left(\frac{s + \sqrt{3}}{\sqrt{3}}\right) = g^{-1}(s)$$

$$\Gamma\left(3^{-1}(s)\right) = \frac{s + \sqrt{3}}{\sqrt{3}} \left(sin\left(\ln\left(\frac{s + \sqrt{3}}{\sqrt{3}}\right)\right) \cos\left(\ln\left(\frac{s + \sqrt{3}}{\sqrt{3}}\right)\right)\right)$$