

$$1- L1: x=4t+2, y=3, z=-t+1$$

$$L2: x=2s+2, y=2s+3, z=s+1$$

$$Q = (3, 6, 6)$$

$$V_1 = \langle 4, 0, -1 \rangle$$

$$V_2 = \langle 2, 2, 1 \rangle$$

$$r(t) = (2s+2)i + (2s+3)j + (s+1)k$$

$$V = \langle 2, 2, 1 \rangle$$

$$P(2s+2, 2s+3, s+1)$$

$$\vec{PQ} = \langle 3-(2s+2), 6-(2s+3), 6-(s+1) \rangle$$

$$\langle 1-2s, 3-2s, 5-s \rangle$$

$$PQ \cdot V = 0$$

$$2(1-2s) + 2(3-2s) + 1(5-s) = 0$$

$$2-4s + 6-4s + 5-s = 0$$

$$-9s + 13 = 0$$

$$s = \frac{13}{-9}$$

$$PQ = 1 - 2\left(\frac{13}{-9}\right), 3 - 2\left(\frac{13}{-9}\right), 5 - \left(\frac{13}{-9}\right)$$

$$PQ = \langle 3.88, 5.88, 6.44 \rangle$$

$$d = |\vec{PQ}| = \sqrt{(3.88)^2 + (5.88)^2 + (6.44)^2}$$

$$= 9.54 \text{ u}$$

$$V_1 = \langle 4, 0, -1 \rangle$$

$$V_2 = \langle 2, 2, 1 \rangle$$

$$\frac{4}{2} \neq \frac{0}{2} \neq \frac{-1}{1}$$

No son rectas
paralelas

$$2: P(1,0,-1) \quad Q(2,4,5) \quad \text{y} \quad R(3,1,7)$$

$$\vec{PQ} = (2-1, 4-0, 5+1) = \langle 1, 4, 6 \rangle$$

$$\vec{PR} = (3-1, 1-0, 7+1) = \langle 2, 1, 8 \rangle$$

$$PQ \times PR = \begin{vmatrix} i & j & k \\ 1 & 4 & 6 \\ 2 & 1 & 8 \end{vmatrix} = + \begin{vmatrix} 4 & 6 \\ 1 & 8 \end{vmatrix} - \begin{vmatrix} 1 & 6 \\ 2 & 8 \end{vmatrix} + \begin{vmatrix} 1 & 4 \\ 2 & 1 \end{vmatrix} =$$

$$[(4)(8) - (1)(6)] - [(1)(8) - (2)(6)] + [(1)(1) - (2)(4)]$$

$$[32 - 6] - [8 - 12] + [1 - 8]$$

$$[26i + 4j - 7k]$$

$$P_0 = R(3,1,7)$$

$$P_1 = Q(2,4,5)$$

$$26(x-3) + 4(y-1) - 7(z-7) = 0$$

$$26x - 78 + 4y - 4 - 7z + 49 = 0$$

$$26x + 4y - 7z - 33 = 0$$

$$26(x-2) + 4(y-4) - 7(z-5) = 0$$

$$26x - 52 + 4y - 16 - 7z + 35 = 0$$

$$26x + 4y - 7z - 33 = 0$$

$$3 = (t \cos t) + (t \sin t) + \left(\frac{2\sqrt{2}}{3} + \frac{3}{2} \right) \text{ K } t = \pi \quad Q = A - P$$

$$\frac{d}{dt}(t \cos t) = \frac{d}{dt}[t] \cdot \cos(t) + t \cdot \frac{d}{dt}[\cos(t)]$$

$$= 1 \cos(t) + t(-\sin t)$$

$$= \cos t - t \sin t$$

$$\frac{d}{dt}(t \sin t) = \frac{d}{dt}[t] \cdot \sin t + t \cdot \frac{d}{dt}[\sin t]$$

$$\sin t + t \cos t$$

$$\frac{d}{dt} \left(\frac{2\sqrt{2}}{3} + \frac{3}{2} \right) = \frac{3}{2} \left(\frac{2\sqrt{2}}{3} + \frac{1}{2} \right) = \sqrt{2} + \frac{1}{2} = \sqrt{2} \sqrt{t}$$

$$r'(t) = (\cos t - t \sin t) + (\sin t + t \cos t) + (\sqrt{2} \sqrt{t})$$

$$\langle 0.82, 3.1916, 2.50 \rangle = \sqrt{(0.82)^2 + (-3.19)^2 + (2.50)^2} \approx 4.135$$

Velocidad

$$r''(t) = -\sin t - (\sin t + t \cos t) + \cos t + (\cos t - t \sin t) + \frac{1}{2\sqrt{t}} = \frac{\sqrt{2}}{2\sqrt{t}}$$

$$\langle -3.24, 1.82, 0.3989 \rangle \text{ aceleración}$$

Velocidad $\langle 0.82, 3.1916, 2.50 \rangle$

Propiedad 4.135

Aceleración $\langle -3.24, 1.82, 0.3989 \rangle$

$$4: A = 0.885t - 22.4h + 1.20th - 0.514 \quad \rightarrow \quad (1.20t) - 5$$

$$\frac{dA}{dt} = 0.885 + 1.20h \Big|_{30}^{0.8} \quad \frac{dA}{dh} = -22.4 + 1.20t$$

$$0.885 + 1.20(0.8)$$

$$1.845$$

$$-22.4 + 1.20(30)$$

$$13.6$$

$$\frac{dA}{dh} > \frac{dA}{dt}$$

Influye mas la humedad que la temperatura

$$5: W = 13.12 + 0.6215T - 11.37v^{0.16} + 0.3965TV^{0.16}$$

$$\frac{dW}{dt} = 0.6215 + 0.3965V^{0.16}$$

$$\frac{dW}{dv} = -\frac{1.8192}{v^{0.84}} + \frac{0.06344T}{v^{0.84}}$$

$$dt = 0.5 \text{ } ^\circ\text{C/h}$$

$$dv = 0.2 \text{ km/h}$$

$$\left[(0.6215 + 0.3965V^{0.16})(0.5) \right] + \left[\left(-\frac{1.8192}{v^{0.84}} + \frac{0.06344}{v^{0.84}} \right)(0.2) \right]$$

$$\left[(0.6215 + 0.3965(26)^{0.16})(0.5) \right] + \left[\left(-\frac{1.8192}{(26)^{0.84}} + \frac{0.06344}{(26)^{0.84}} \right)(0.2) \right]$$

$$0.6496 - 0.0227 = \underline{0.6219}$$

$$W = 13.12 + 0.6215(-11) - 11.37(26)^{0.16} + 0.3965(-11)(26)^{0.16}$$

$$W = 6.2835 - 19.1494 = -7.3456$$

$$= -20.2115$$

$$\frac{0.6219}{-20.2115} = \underline{-0.03} = -3\%$$

$$V = IR \quad R = 400 \Omega$$

$$V = 0.08 \text{ V}$$

$$\frac{dV}{dt} = -0.01 \frac{\text{V}}{\text{s}}$$

$$\frac{dB}{dt} = 0.03 \frac{\Omega}{\text{s}}$$

$$\frac{V}{R} = 1$$

$$\frac{dI}{dV} = \frac{1}{R}$$

$$\frac{dI}{dB} = -\frac{V}{R^2}$$

$$\frac{dV}{dt} \frac{dI}{dV} + \frac{dB}{dt} \frac{dI}{dB}$$

$$\left(\frac{1}{R}\right)(-0.01) + \left(\frac{V}{R^2}\right)(0.03)$$

$$\left(\frac{1}{400}\right)(-0.01) + \left(\frac{0.08}{400^2}\right)(0.03)$$

$$-0.000025 + 0.00000015$$

$$-0.000024985 = -2.4985 \times 10^{-5}$$

8- Determine los extremos $f(x,y) = y^2 - 4x$ sujetos $x^2 + y^2 = 9$

$$f(x,y) = y^2 - 4x$$
$$s.a = g(x,y) = x^2 + y^2 = 9 = x^2 + y^2 - 9 = 0$$

$$1- F(x,y,h) = f(x,y) + hg(x,y)$$
$$F(x,y,h) = y^2 - 4x + h(x^2 + y^2 - 9)$$

$$2- F_x = \frac{dx}{df} = -4 + 2xh$$

$$F_y = \frac{dy}{df} = 2y + 2yh$$

$$Fh = x^2 + y^2 - 9$$

$$3- -4 + 2xh = 0$$
$$hx = \frac{4}{2x}$$

$$2y + 2yh = 0$$
$$= -\frac{2y}{2y}$$

$$hy = -1$$

$$4- \frac{4}{2x} = -1$$

$$5- fh(x,y) = x^2 + y^2 - 9 = 0$$

$$(-2)^2 + y^2 - 9 = 0$$

$$4 = -1(2x)$$

$$4 = -2x$$

$$\frac{4}{-2} = x$$

$$-2 = x$$

$$y^2 = 9 - 4$$

$$y = \sqrt{5}$$

$$y' = +2.23$$

$$y' = -2.23$$

$$6- f(-2, 2.23) = \begin{matrix} y^2 - 4x \\ 12.9729 \end{matrix} \quad \begin{matrix} \text{Maximo} \\ \text{Minimo} \end{matrix}$$
$$f(-2, -2.23) = \begin{matrix} 12.9729 \end{matrix}$$