EAS-502.

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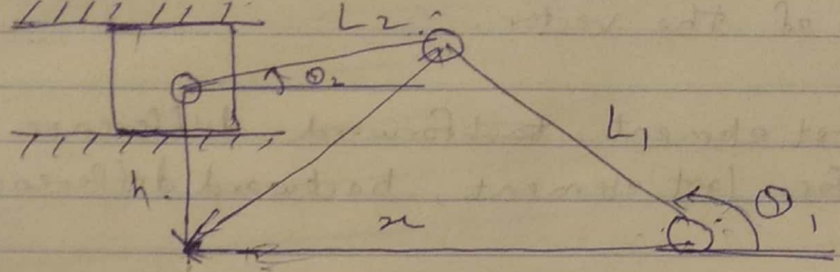
Take-home:- 2

Q.2]

a)



The equation for above system is,

$$h e^{j\theta_3} + L_2 e^{j\theta_2} - L_1 e^{j\theta_1} + x e^{j0} = 0$$

It can be splited as, (using vector addition)

$$h\cos\theta_3 + L_2\cos\theta_2 - L_1\cos\theta_1 + x = 0.$$

$$h\sin\theta_3 + L_2\sin\theta_2 - L_1\sin\theta_1 = 0.$$

here $\theta_3 = \pi/2$

$$\therefore \quad L_2\cos\theta_2 - L_1\cos\theta_1 + x = 0$$

$$h + L_2\sin\theta_2 - L_1\sin\theta_1 = 0 -$$

$$\therefore f_1(\theta_1, x) = h + L_2\sin\theta_2 - L_1\sin\theta_1 \quad \text{— (I)}$$

$$h = 0$$

$$= L_2\sin\theta_2 - L_1\sin\theta_1$$

$$f_2(\theta_2, x) = L_2\cos\theta_2 + x + L_1\cos\theta_1 \quad \text{— (II)}$$

b) (iv) Central difference method can't be used for first & last element of the vector.

For first element, ~~back~~ forword difference method is used & for last element, backword difference method is used.

Q. 1] b)

Function is discontinuous at $t=0$.

$$\frac{dy}{dt} = y\left(-2t + (1/t)\right)$$

$$\therefore \frac{dy}{\cancel{dt}}\frac{1}{y} = dt\left(-2t + (1/t)\right)$$

$\therefore$ Integrating on both the sides

$$\int \frac{dy}{y} = \int \left(-2t + 1/t\right) \cdot dt$$

$$\log y + C = -t^2 + \log t$$

By initial value condition, at $t=0$, $y=1$.

$$y \cdot e^c = e^{-t^2} \cdot t$$

$$1 \cdot e^c = 0$$

$$\therefore e^c = 0$$

$$\therefore c = \log 0$$

$\log 0$ is undefined

$\therefore$ We can't calculate value of constant

Also, when we use function dsolve in matlab, it shows that the eq^n has no solution.