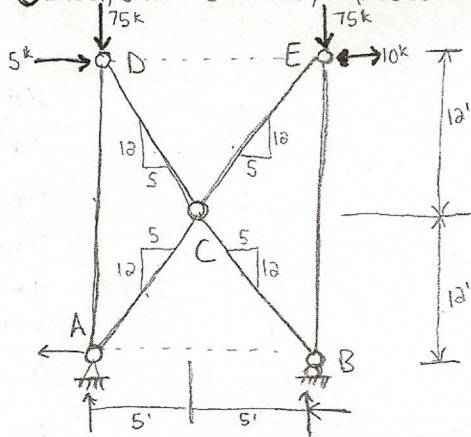


4.23 Determine the force in each member of the truss shown by the method of joints

① Label, show reactions, exploded view



② Draw Slopes

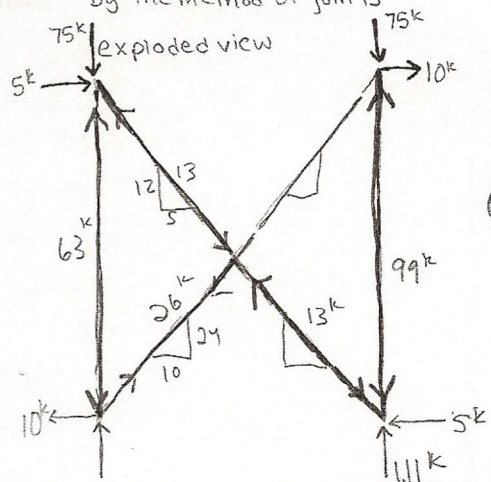
assuming one reactions @ B

$$6 + 3 < 2(5)$$

9 < 10 - unstable

this structure is unstable

UNSTABLE



BUT

assuming roller = hinge

$$\sum M_A = 0$$

$$-5(24) + (10)B_y - 10(24) - 75(10)$$

$$100B_y - 240 - 750$$

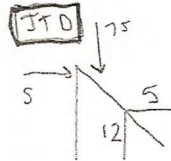
$$100B_y = 1110$$

$$B_y = 111$$

$$A_y + 111 - 75 - 75$$

$$A_y = 39k$$

$$\sqrt{12^2 + 5^2} = 13$$



$$\sum F_x = 0$$

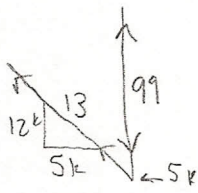
$$5 - D_{cx} = 0$$

$$D_{cx} = 5$$

$$-75 + 12 - D_{cy} = 0$$

$$D_{cy} = 63$$

JTB



$$\sum F_y = 0$$

$$BE - 12 + 111$$

$$BE = 99$$

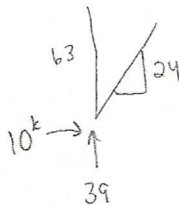
$$\sum F_x = 0$$

$$5 - B_{cy} = 0$$

$$B_{cy} = 5$$

$$\sqrt{5^2 + 12^2} = 13$$

JTA



$$\sum F_x = 0$$

$$-63 + 39 + A_{cy} = 0$$

$$A_{cy} = 24$$

$$\sum F_y = 0$$

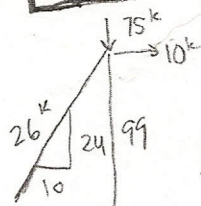
$$-10 + A_{cx} = 0$$

$$A_{cx} = 10$$

$$A_c = 26$$

JTD

JTE



$$\sqrt{24^2 + 10^2} = 26$$

$$\sum F_x = 0$$

$$10 - \sum C_x = 0$$

$$\sum C_x = 10$$

$$\sum F_y = 0$$

$$\sum C_y = 24$$