

Course No. CE 1023

Assignment No. 5 Date FEB 25, 2015

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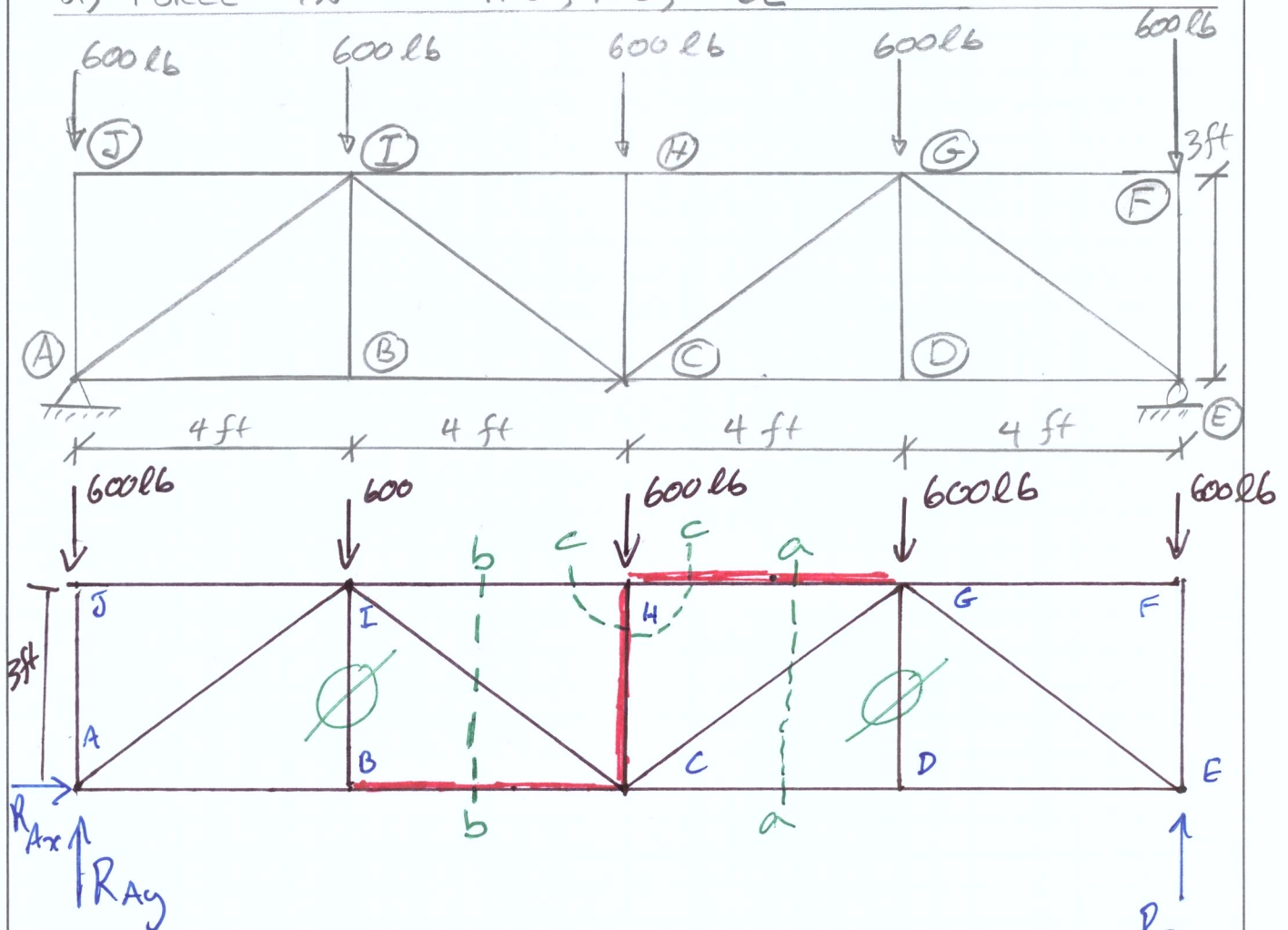
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Problem No. 2

By ALAN LLOYD

of
4FOR THE TRUSS BELOW, FIND

- SI (DETERMINACY)
- STABILITY
- ZERO-FORCE MEMBERS
- FORCE IN HG, HC, BC



$$a) SI = b + r - 2j$$

$$SI = b + r - 2j$$

$$SI = 17 + 3 - 2(10)$$

$$SI = 0 \quad \therefore \text{Determinate}$$

$$b = \# \text{ members} = 17$$

$$r = \# \text{ reactions} = 3$$

$$j = \# \text{ joints} = 10$$

b) • Not all reactions - parallel ✓

• $S \geq 0$ ✓

• No internal collapse mechanism ✓

• Stable

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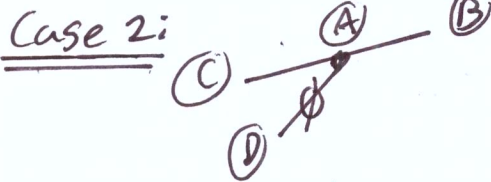
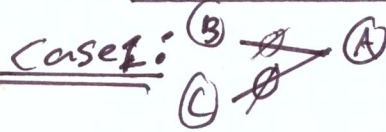
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Problem No.

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of

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c) ZERO-FORCE MEMBERS

Joint	Member	Case
B	BC	Case 2
D	DC	Case 2

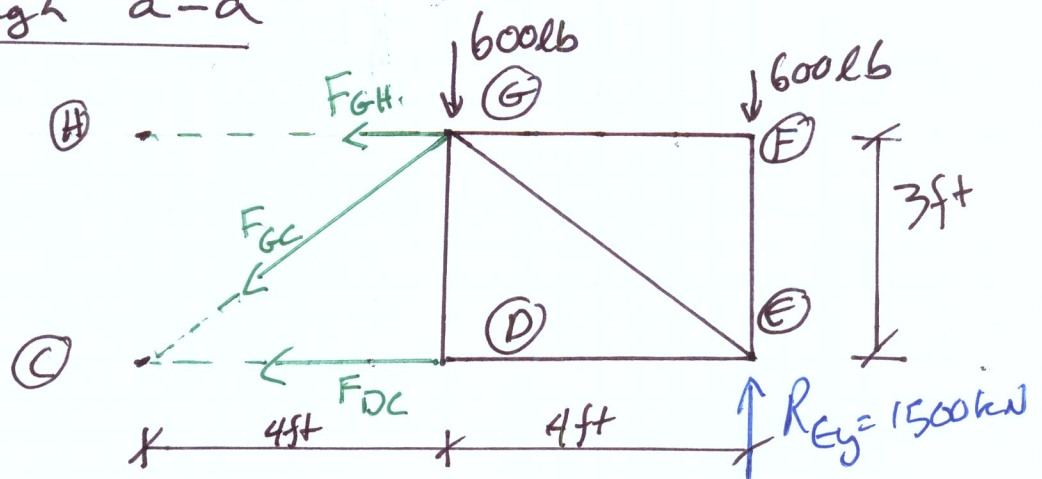
d) F_{HG} , F_{HC} , F_{BC}

• Find $R_{ey} \rightarrow \sum M_A = 0 \rightarrow R_{ey}(16) - 600(4) - 600(8) - 600(12) - 600(16) = 0$

$$R_{ey} = 1500 \text{ lb } \uparrow$$

• Cut through a-a

FBD of RHS

Find F_{GH}

$$\sum M_C = 0 \rightarrow F_{GH}(3) - 600(4) - 600(8) + 1500(8) = 0$$

$$F_{GH} = -1600 \text{ lb}$$

$$F_{GH} = 1600 \text{ lb (C)}$$

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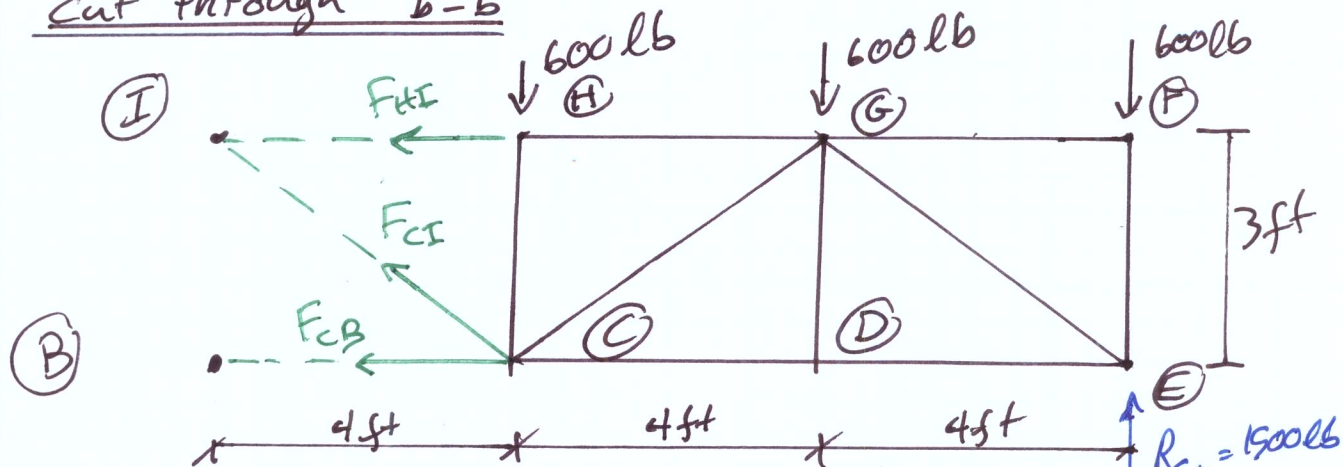
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Problem No.

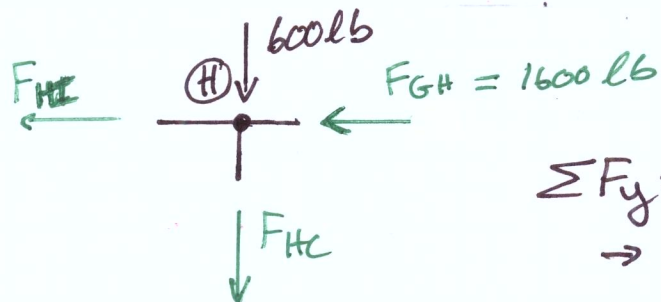
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4cut through b-bFind F_{CB}

$$\sum M_I = 0 \rightarrow R_{ey}(12) - F_{CB}(3) - 600(4) - 600(8) - 600(12) = 0$$

$$-F_{CB}(3) - 14400 + 1500(12) = 0$$

$$F_{CB} = +1200 \text{ lb}$$

$$F_{CB} = 1200 \text{ lb (T)}$$

cut through c-c

$$\sum F_y = 0$$

$$\rightarrow -F_{HC} - 600 = 0$$

$$F_{HC} = -600 \text{ lb}$$

$$F_{HC} = 600 \text{ lb (C)}$$

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Problem No.

By **ALAN LLOYD**of **4**Summary Diagram