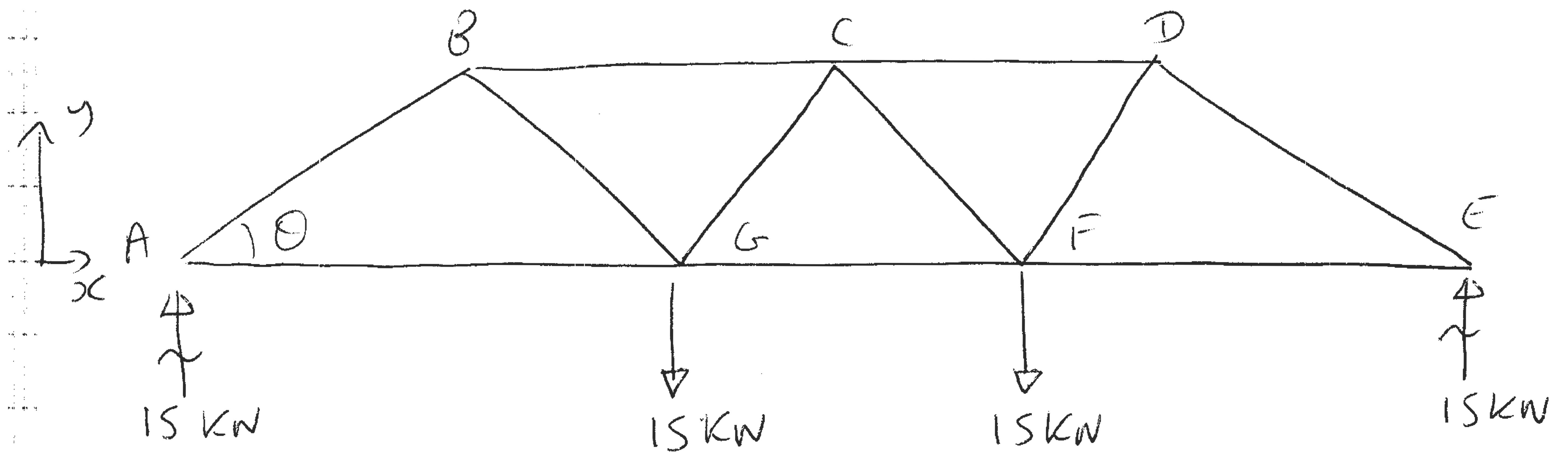
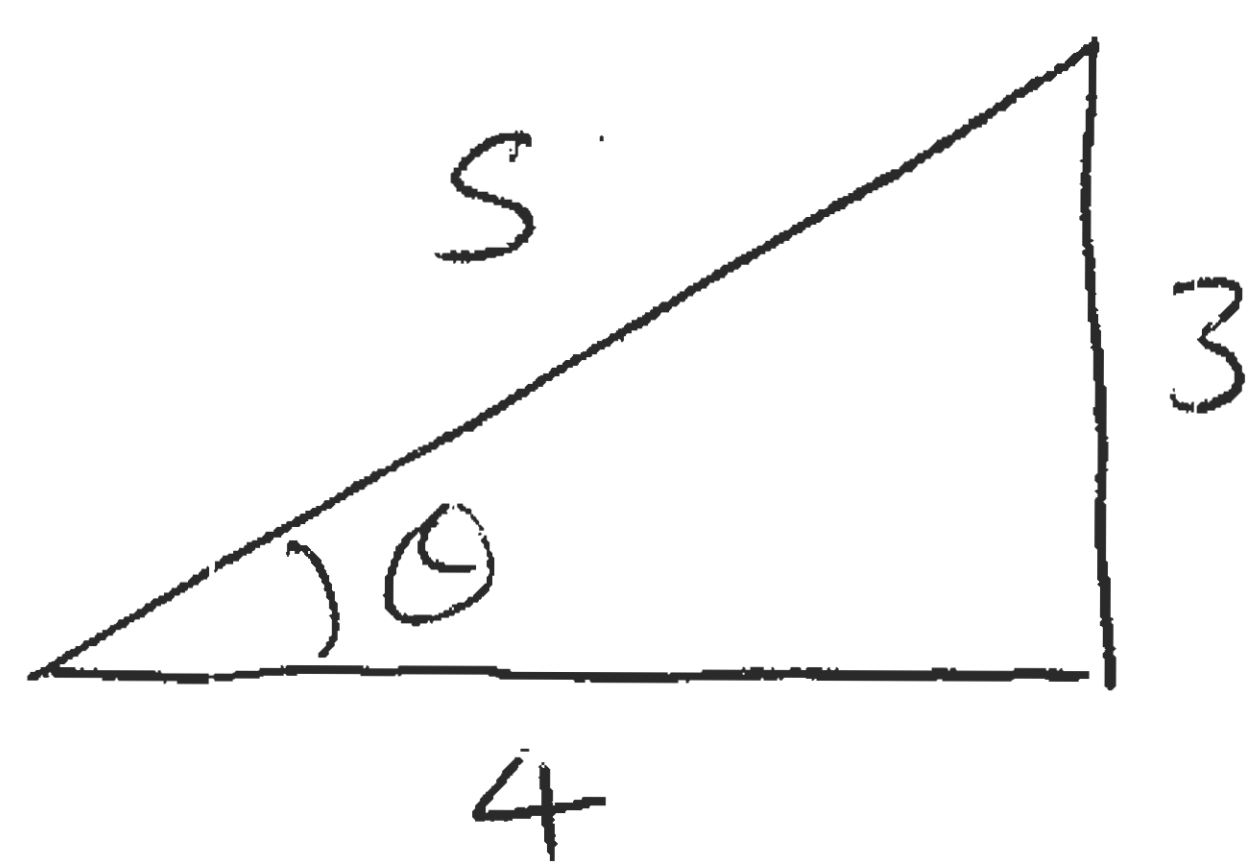


Solutions MS.

From M4 FBD with reactions



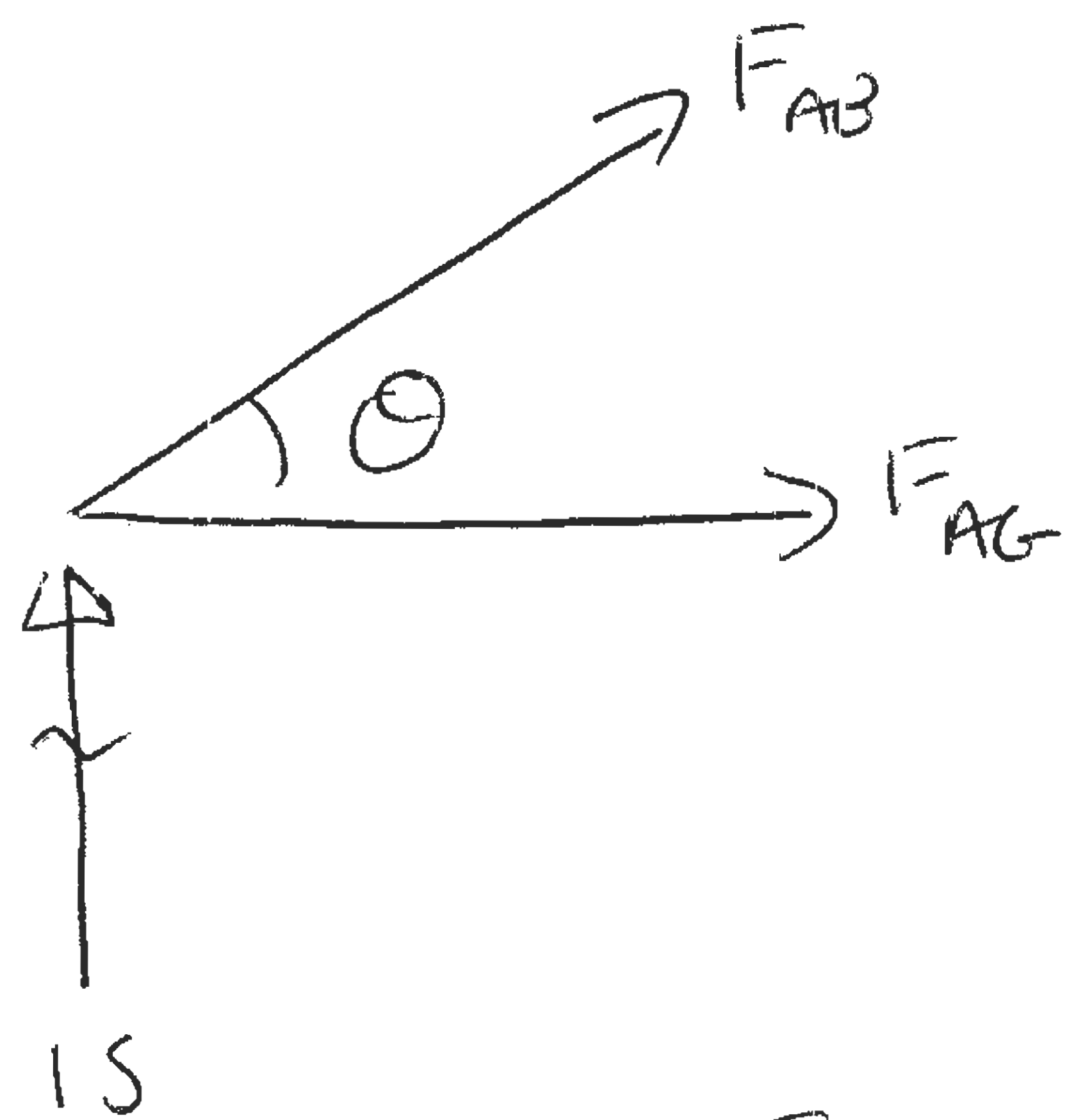
Note



$$\cos \theta = \frac{4}{5} \quad \sin \theta = \frac{3}{5}$$

Use method of joints

Joint A



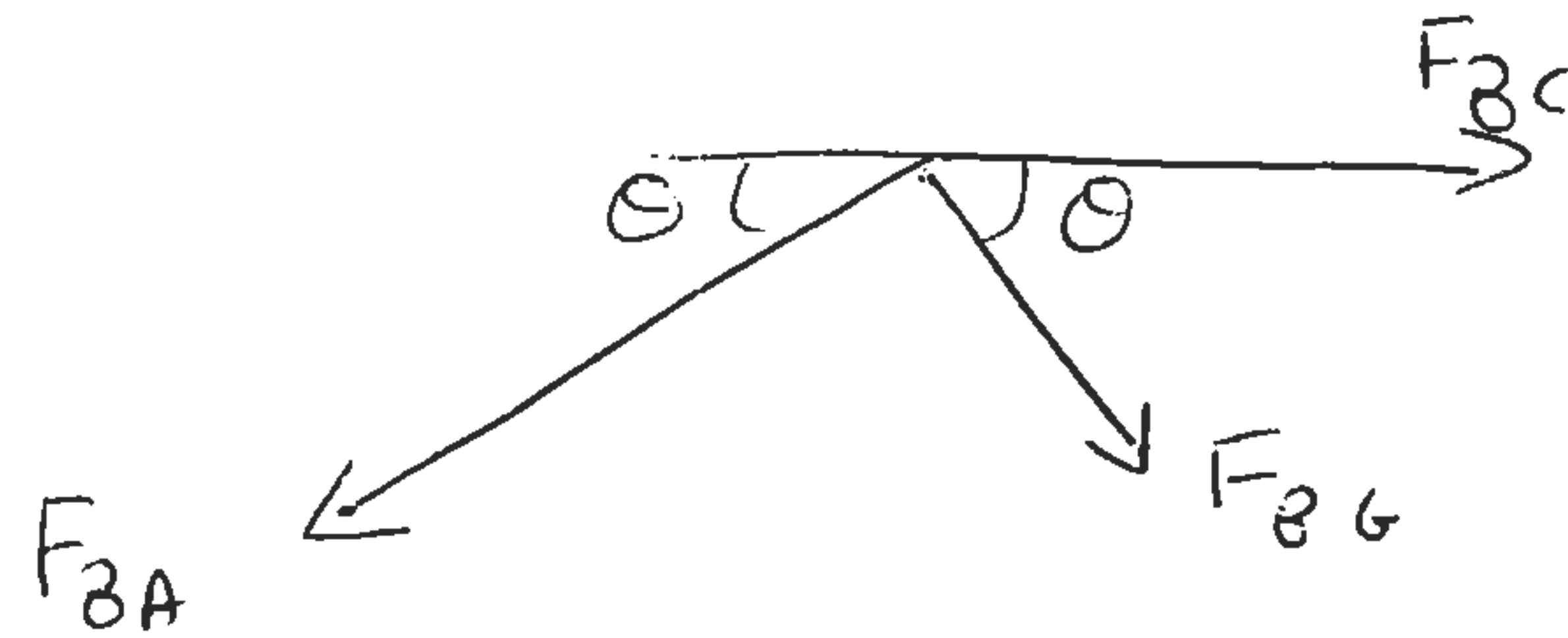
$$\sum \vec{F}_x = 0: F_{AG} + F_{AB} \cos \theta = 0 \quad (1)$$

$$\sum F_y \uparrow = 0: F_{AB} \sin \theta + 15 = 0 \quad (2)$$

$$F_{AB} = -\frac{15}{\sin \theta} = -15 \cdot \frac{5}{3} = \underline{\underline{-25 \text{ kN}}}$$

$$F_{AG} = -F_{AB} \cos \theta = +25 \cdot \frac{4}{5} = +20 \text{ kN}$$

Joint B



$$\sum \vec{F}_x = 0 \quad F_{BC} + F_{BG} \cos \theta - F_{BA} \cos \theta = 0 \quad (3)$$

$$\sum F_y \uparrow = 0 \quad -F_{BA} \sin \theta - F_{BG} \sin \theta = 0 \quad (4)$$

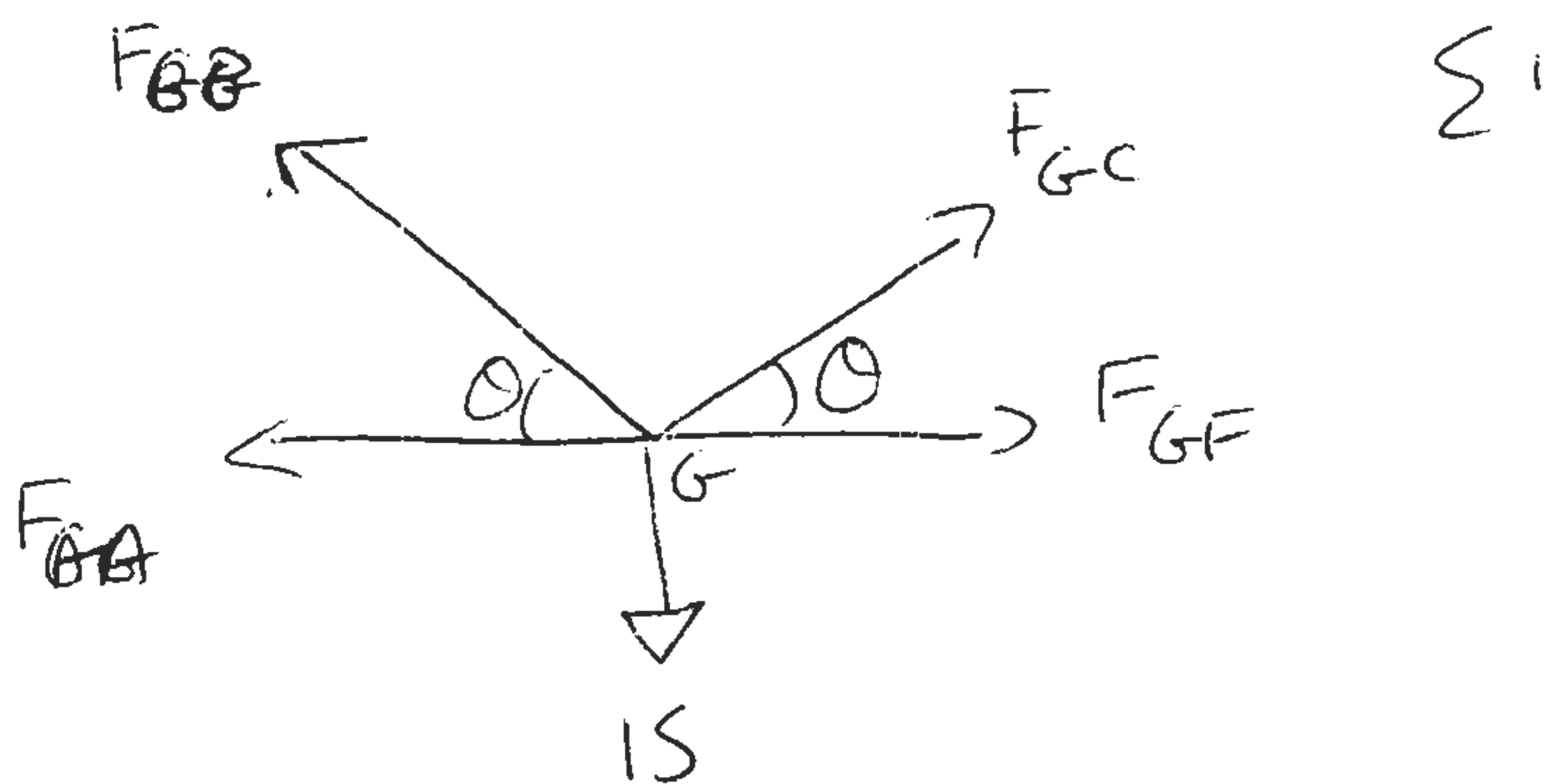
$$F_{BA} = -F_{BG}$$

from Joint A $F_{BA} = -25 \text{ kN} \Rightarrow F_{BG} = +25 \text{ kN}$

From (3) $F_{BC} + 25 \cos \theta - (-25 \cos \theta) = 0$

$$F_{BC} + 50 \frac{4}{5} = 0 \quad F_{BC} = -40 \text{ kN} \Leftarrow$$

from Joint G



$$\sum \vec{F}_x = 0: \quad -F_{GA} - F_{GB} \cos \theta + F_{GC} \cos \theta + F_{GF} = 0 \quad (5)$$

$$\sum F_y \uparrow = 0 \quad F_{GB} \sin \theta + F_{GC} \sin \theta - 15 = 0 \quad (6)$$

From joint B $F_{GB} = +25 \text{ kN}$

From joint A $F_{GA} = +20 \text{ kN}$

$$\therefore \overset{15}{25} \times \frac{3}{5} + F_{GC} \times \frac{3}{5} - 15 = 0$$

$$F_{GC} = 0 \quad \Leftarrow$$

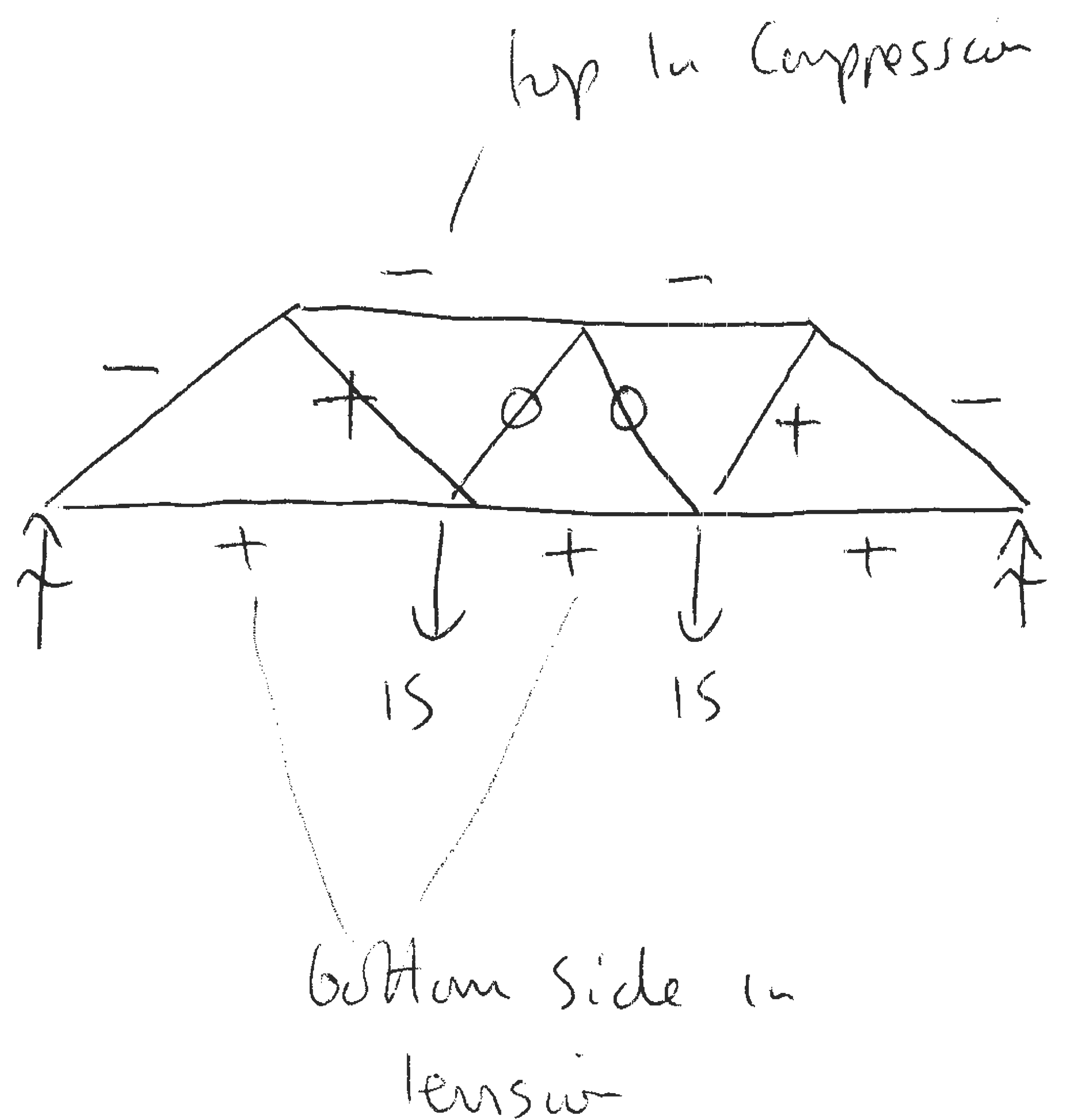
From G: $-20 - 25 \times \frac{4}{5} + 0 + F_{GF} = 0$

$$F_{GF} = +40 \text{ kN}$$

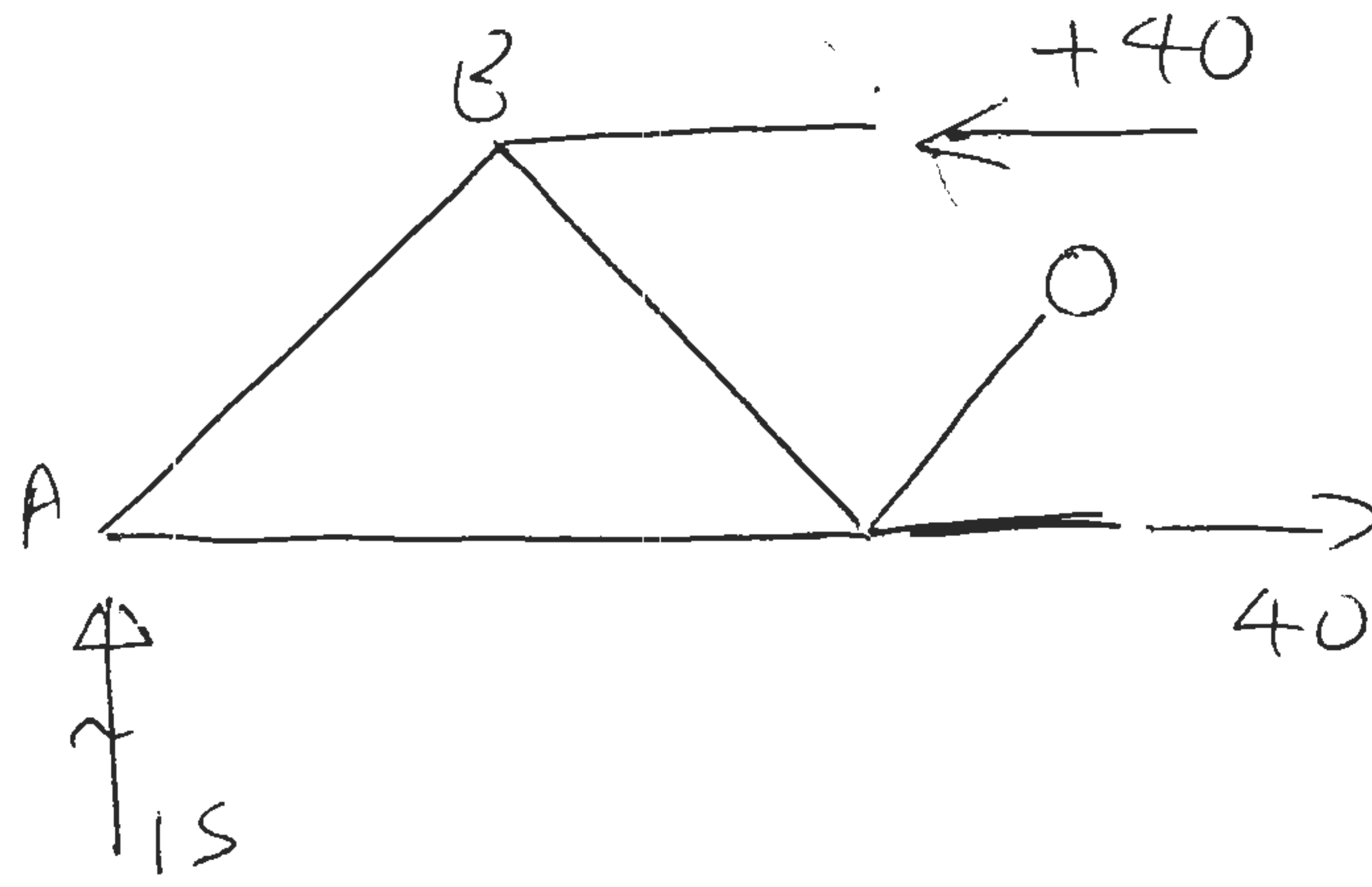
Have solved for bar forces in LH half of truss. By symmetry, forces in RHS must be identical

Tabulate

Bar	Force / kN
F_{AB}	-25
F_{AG}	+20
F_{BC}	-40
F_{BG}	+25
F_{GC}	0
F_{CF}	0
F_{CD}	-40
F_{GF}	+40
F_{FD}	+25
F_{DE}	-25
F_{EF}	+20



check
Apply method of sections



looks right