

M R

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مدرس خصوصي

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يُحصل الطالب علي

• مقاطع فيديو هات لشرح المقرر بشكل وافي

• ملخص للمادة Pdf للمذكرة واطراجة

• محاضرات مباشرة علي برنامج زووم

• مناقشة الأجزاء الغير مفهومة

• تواصل مستمر مع معلم المادة

للتواصل

0567630097

0565657741



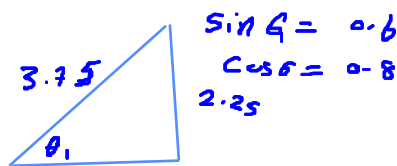
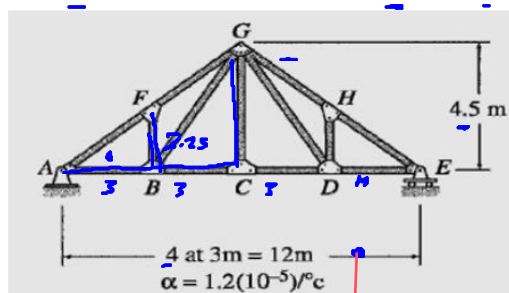
Example No (3)

- Determine the vertical deflection at joint C of the truss shown in Fig.

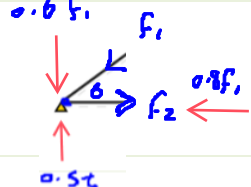
below due to a temperature drop of 8°C in members

AB and BC and a temperature increase of 30°C in members AF; FG; GH;

and EH. Use the virtual work method.

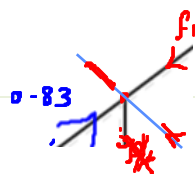


joint method



$$\frac{0.6 f_1}{0.6} = \frac{0.5}{0.8} \Rightarrow f_1 = 0.83$$

$$f_2 = -0.8 \times 0.83$$



TABLE

Member	L (m)	ΔT ($^\circ\text{C}$)	F_v (kN)	$F_v(\Delta T)L$ (kN- $^\circ\text{C}$ -m)
AB	3	-8	0.667	-16.0
BC	3	-8	0.667	-16.0
AF	3.75	30	-0.833	-93.7
FG	3.75	30	-0.833	-93.7
GH	3.75	30	-0.833	-93.7
EH	3.75	30	-0.833	-93.7

$$\sum F_v(\Delta T)L = -406.8$$

$$\Delta_C = \sum F_v \Delta T L$$

$$1(\Delta_C) = \alpha \sum F_v(\Delta T)L$$

$$(1 \text{ kN})\Delta_C = 1.2(10^{-5})(-406.8)$$

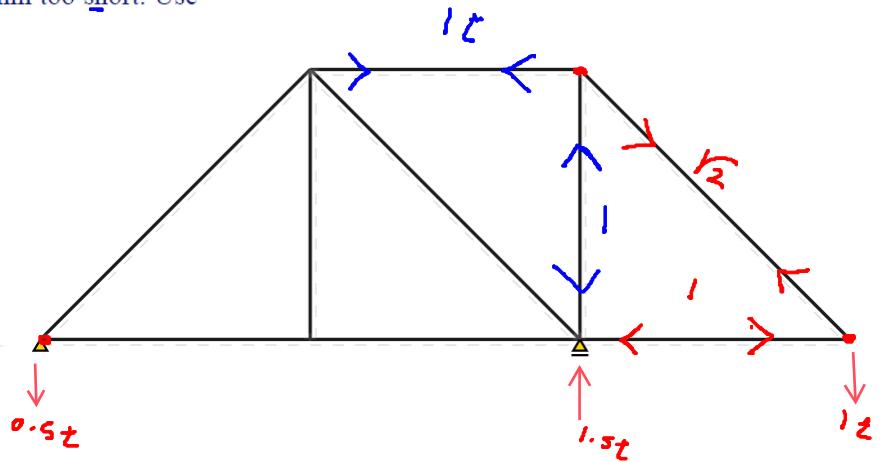
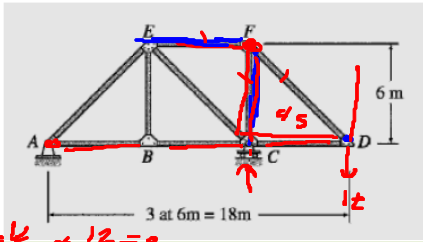
$$\Delta_C = -0.00488 \text{ m}$$

$$\Delta_C = 4.88 \text{ mm } \uparrow$$

Example No (4)

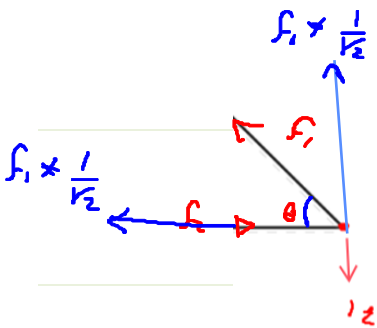
Determine the vertical deflection at joint D of the truss shown in Fig. below if member CF is 15 mm too long and member EF is 10 mm too short. Use the method of virtual work

$$\sin \theta = \frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}}$$



Member	δ (mm)	F_v (kN)	$F_v(\delta)$ (kN-mm)
CF	15	-1	-15
EF	-10	1	-10
			$\sum F_v(\delta) = -25$

$$\Delta_D = 25 \text{ mm} \uparrow$$



$$\sum F_x = -F_1 + F_2 \times \frac{1}{\sqrt{2}} = 0$$