M R
Ahmed Mahdy

استاتيكا	فيزياء
الكـــترونيات	دوائر كهربية
هيدروليكا	ميكانيكا الانشائات

مدرس خصوصي

اونلاين   حضوري

يحصل الطالب علي

• مقاطع فيديوهات لشرح المقرر بشكل وافي

• ملخص للمادة Pdf للمذكرة والمراجعة

• محاضرات مباشرة علي برنامج زووم لمناقشة الأجزاء الغير مفهومة

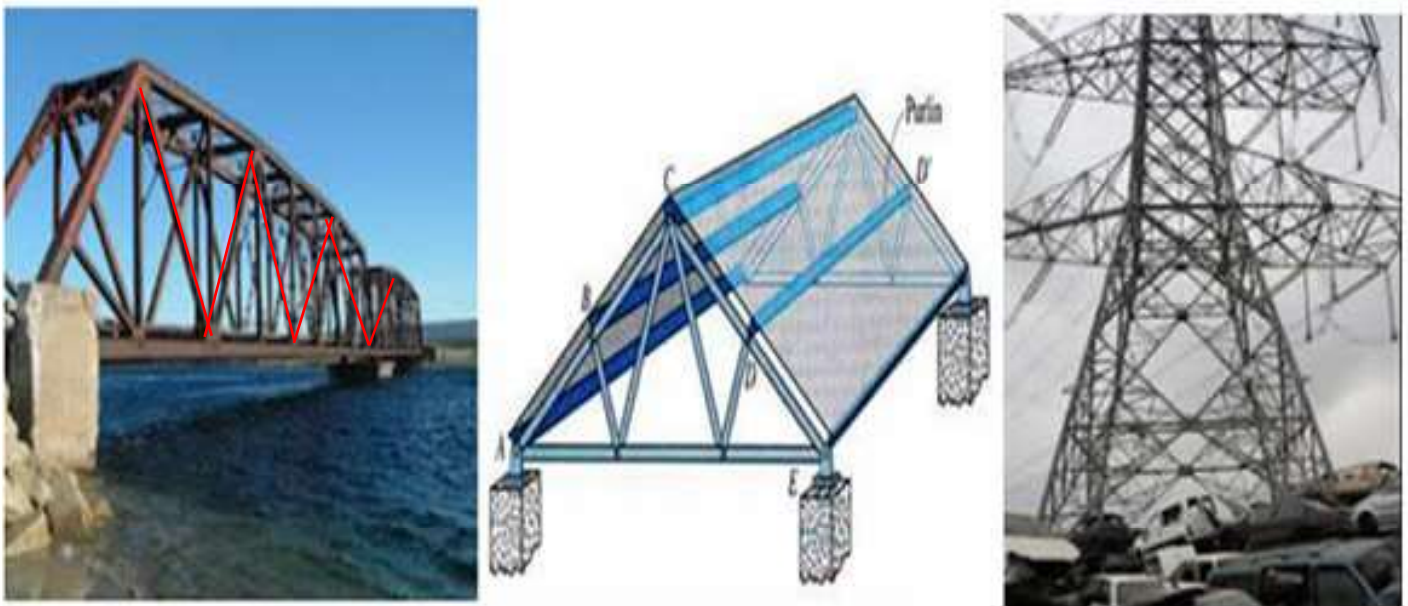• تواصل مستمر مع معلم المادة

للتواصل

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بِسْمِ اللهِ الرَّحْمَنِ الرَّحِيمِ

Structural Mechanics

8012206-3

Plane Trusses

Trusses are most commonly used in bridges, roofs and towers as shown in figure (2).

Figure 2: Commonly used of Truss

Types of plane trusses

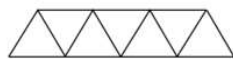Some other truss types seen in roof or bridge structures are shown in figure (3) below:
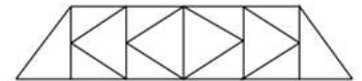

Pratt Truss

Howe Truss

Parker Truss: Pratt with curved chord

K Truss

Deck Pratt Truss

Warren Truss

Saw-tooth Truss

Three-hinged Arch

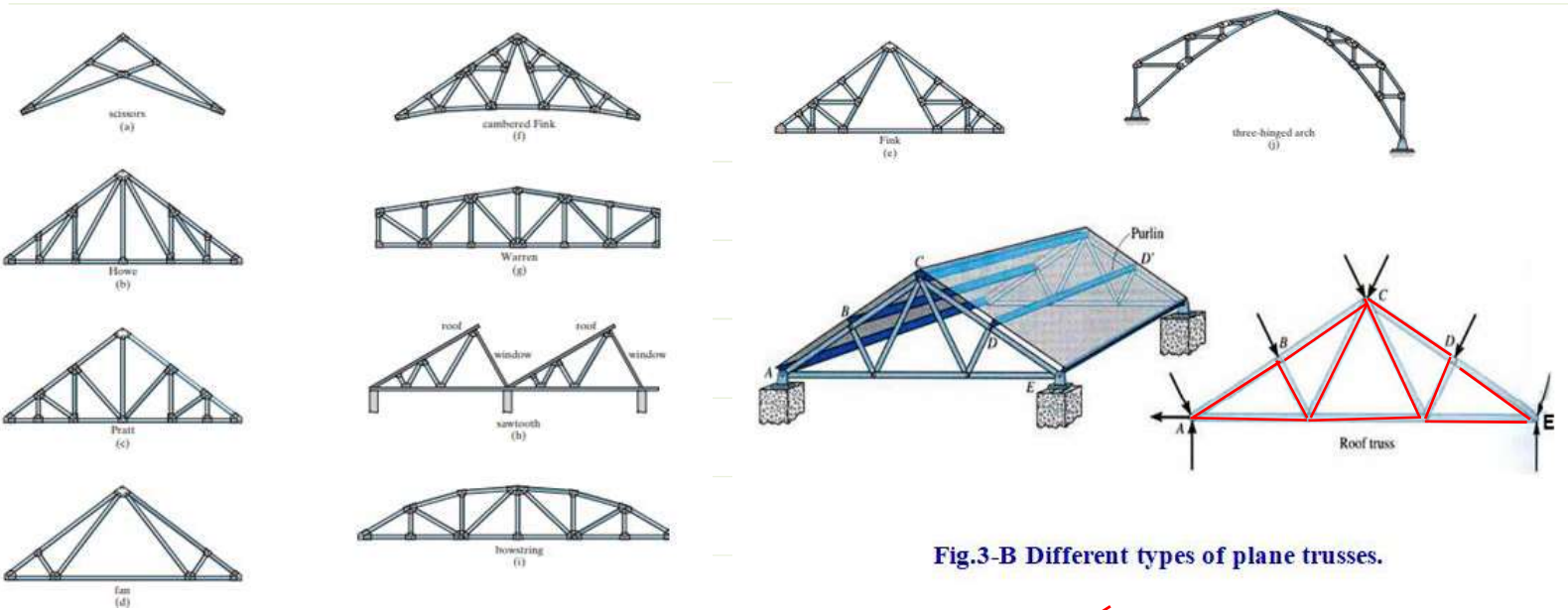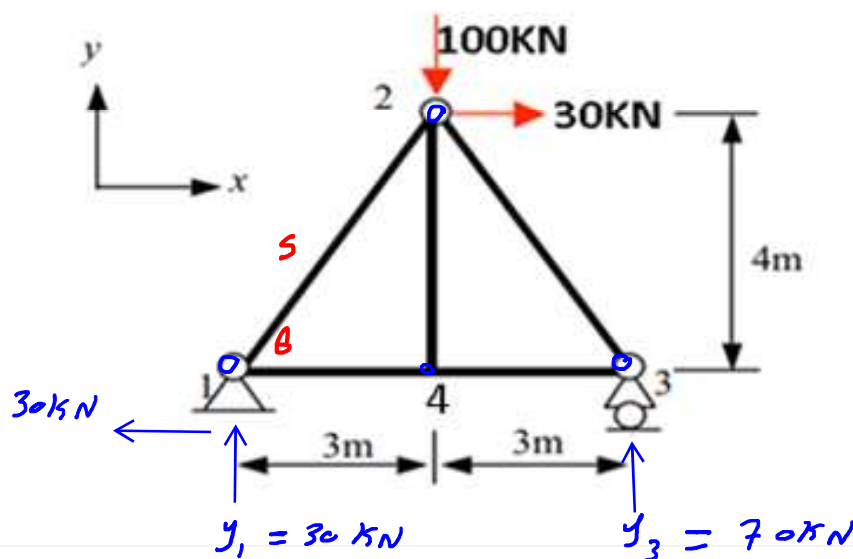**Fig.3- A Different types of plane trusses.**

Fig.3-B Different types of plane trusses.

Compression

Tension

Example No 1.

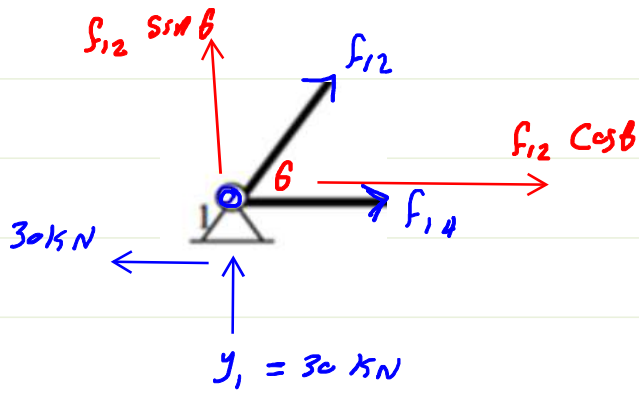Find all support reactions and member forces of the loaded truss shown by the joint method

$$\Sigma M_1 = 100 * 3 + 30 * 4 - y_3 * 6 = 0$$

$$y_3 = 70 \, kN$$

$$\Sigma f_y = y_1 - 100 + 70 = 0$$

$$y_1 = 30 \, kN$$

$$Sin \theta = 0.8 , \quad Cos \theta = 0.6$$

f_{12} $sin\theta$ f_{12}

f_{12} $cos\theta$

θ

6

f_{14}

30KN

$y_1 = 30\ KN$

$\Sigma F_z = 0$, $\Sigma F_y = 0$, $\Sigma r\!\!\!\!/\!\!\!/ = 0$

$\Sigma F_z = f_{12}\ cos\theta + f_{14} - 30 = 0$

$\Sigma F_y = f_{12}\ \overset{0.8}{sin\theta} + 30 = 0$ $\Rightarrow$ $f_{12} = \dfrac{-30}{0.8} = -37.5\ KN \Rightarrow 37.5\ KN\ Comp$
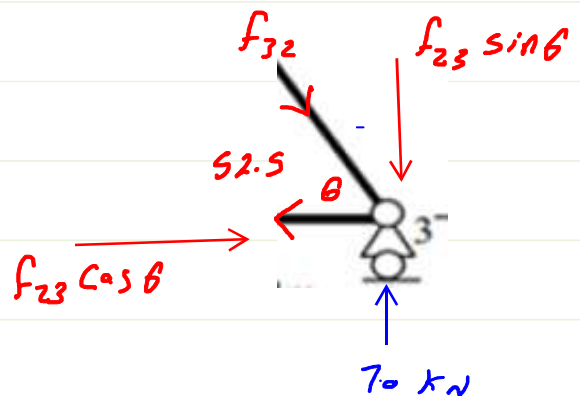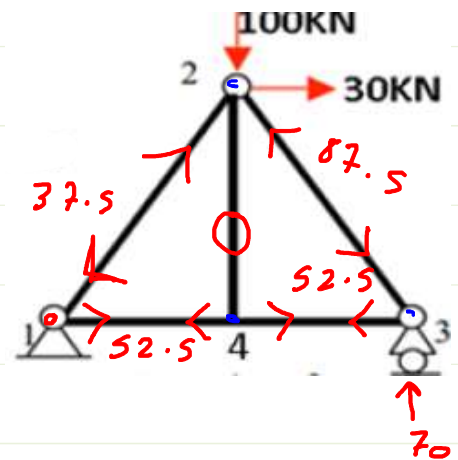
$\Sigma F_z = -37.5 * 0.6 + f_{14} - 30 = 0$

$f_{14} = 52.5\ KN\ Ten$

at joint 4

525

4

52.5

$f_{43} = 52.5\ Ten$

at joint 3

100KN

2 30KN

87.5

37.5

1   52.5 4   52.5   3

70

f_{32} $f_{23}\ sin\theta$

52.5

θ

$f_{23}\ cos\theta$

3

70 KN
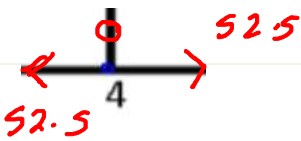
$\Sigma F_z = f_{23} * 0.6 - 52.5 = 0$

$f_{23} = 87.5\ KN\ Comp$

$\Sigma F_y = 70 - 87.5 * 0.8 = 0$