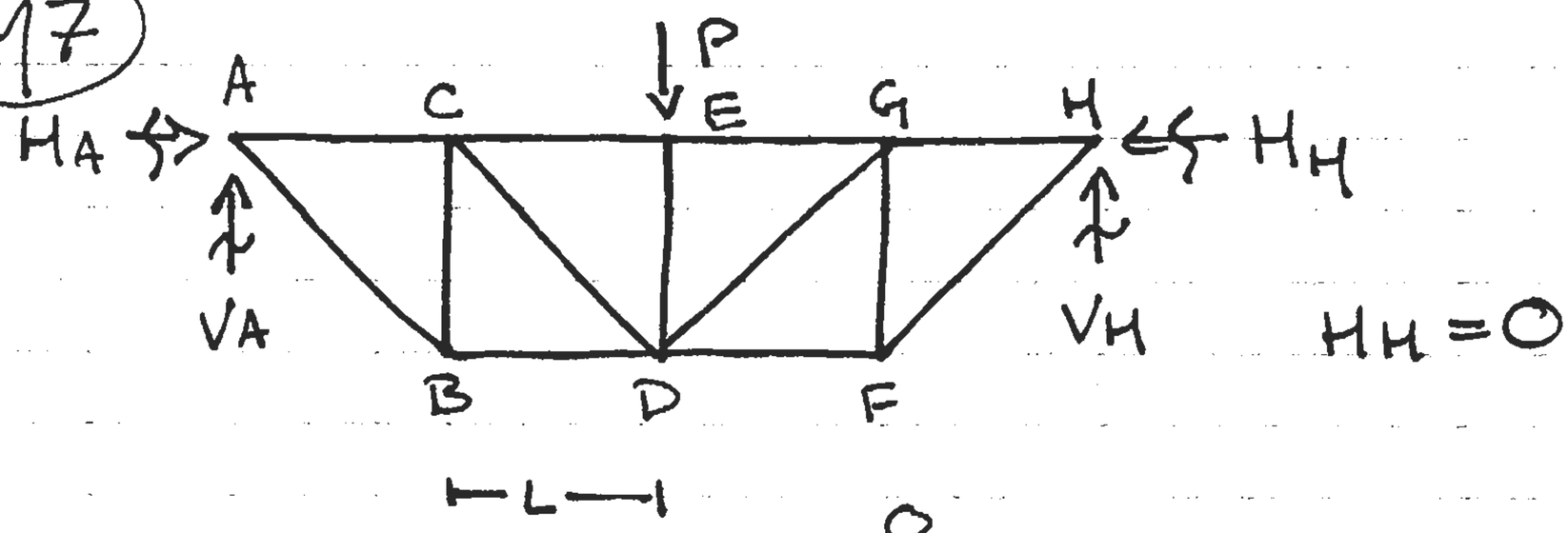
M7



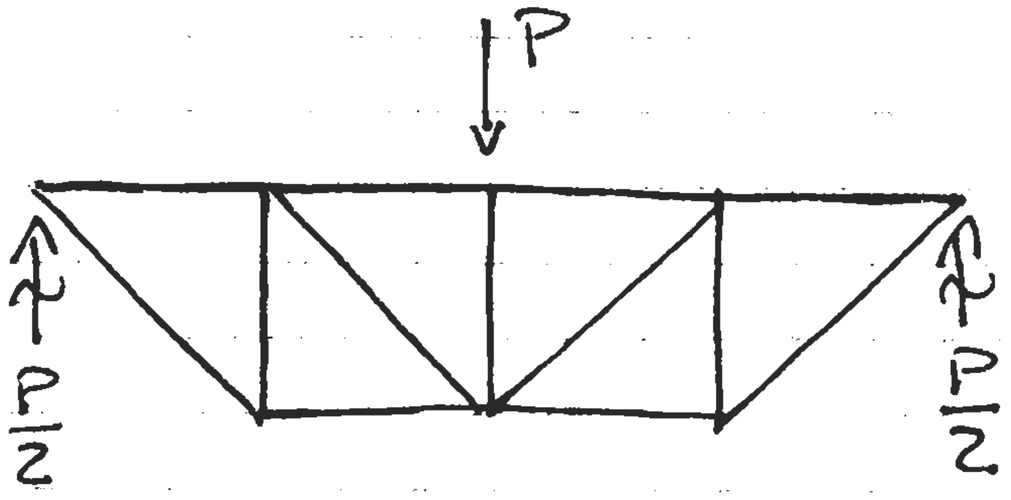
$H_H = 0$

$\Sigma \vec{F}_x = 0 \quad H_A + \cancel{H_H}^{0} = 0 \quad H_A = 0$

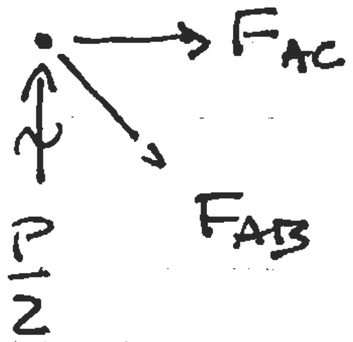
$\Sigma \vec{F}_y = 0 \quad V_A + V_H - P = 0$

$\left(\Sigma M_A = 0\right) \quad V_H(4L) - P(2L) = 0$

$V_H = \frac{P}{2} \quad + \quad V_A = \frac{P}{2}$ (also from symmetry)



Using the method of joints @ A:



$\Sigma F_y \uparrow = 0$

$\frac{P}{2} - F_{AB} \cos 45^\circ = 0$

$F_{AB} = \frac{\sqrt{2}P}{2}$

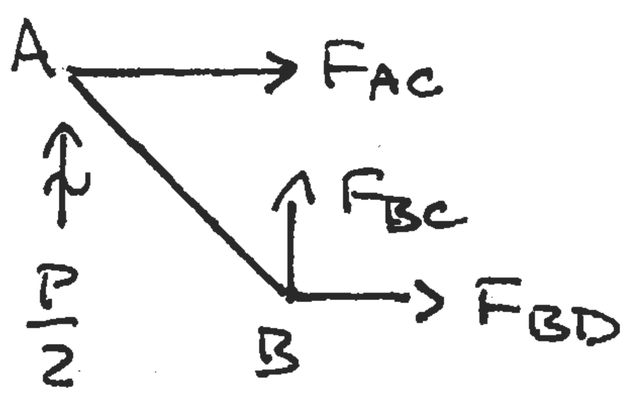
$\Sigma \vec{F}_x = 0$

$F_{AC} + \frac{\sqrt{2}P}{2} \cos 45^\circ = 0$

$F_{AC} = -\frac{P}{2}$

→

Method of Sections:



$$\Sigma F_y \uparrow = 0$$

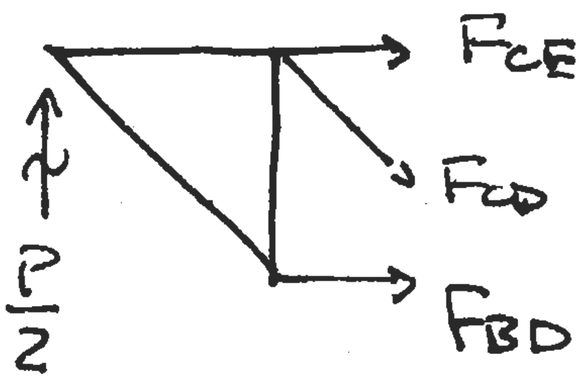
$$F_{BC} + \frac{P}{2} = 0$$

$$F_{BC} = -\frac{P}{2}$$

Method of Sections: $\circlearrowright \Sigma M_C = 0$

$$-\frac{P}{2}(L) + F_{BD}(L) = 0$$

$$F_{BD} = \frac{P}{2}$$



$$\Sigma F_y \uparrow = 0 \qquad \frac{P}{2} - F_{CD}\sin 45^\circ = 0$$

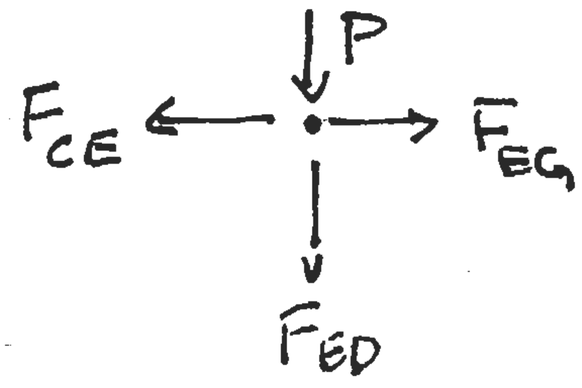
$$F_{CD} = \frac{P}{2}\sqrt{2} = \frac{\sqrt{2}P}{2}$$

$$\circlearrowright \Sigma M_D = 0$$

$$-\frac{P}{2}(2L) - F_{CE}(L) = 0$$

$$F_{CE} = -P$$

Method of Joints @ E:



$$\Sigma F_y \uparrow = 0$$

$$-P - F_{ED} = 0$$

$$F_{ED} = -P$$

By symmetry all other bar forces are the same on the right hand side.

Bar	Force
AB	$\frac{\sqrt{2}}{2}P$
AC	$-P/2$
BC	$-P/2$
CE	$-P$
CD	$\frac{\sqrt{2}}{2}P$
BD	$P/2$
ED	$-P$
EG	$-P$
DG	$\frac{\sqrt{2}}{2}P$
DF	$P/2$
GF	$-P/2$
GH	$-P/2$
FH	$\sqrt{2}P/2$