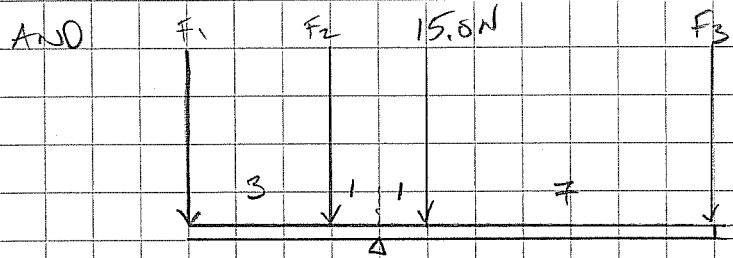
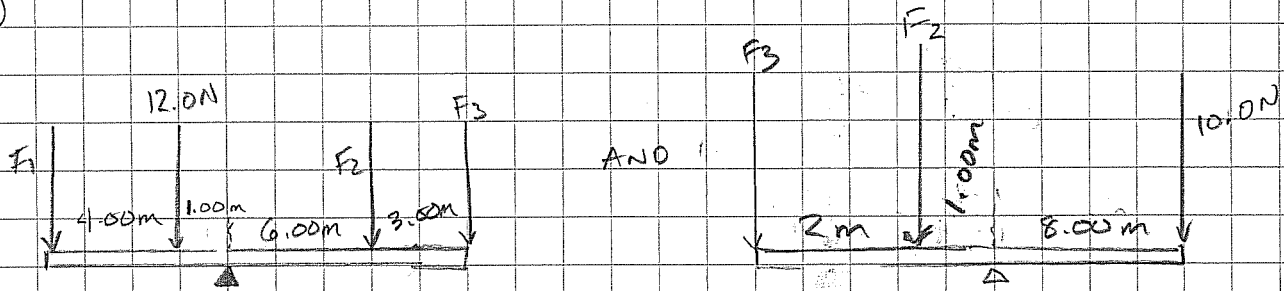
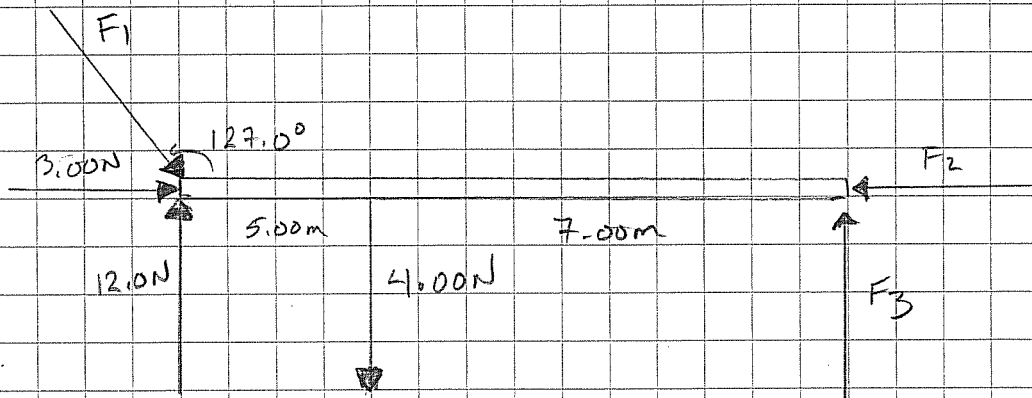


# OVERTURNING MOMENT 2

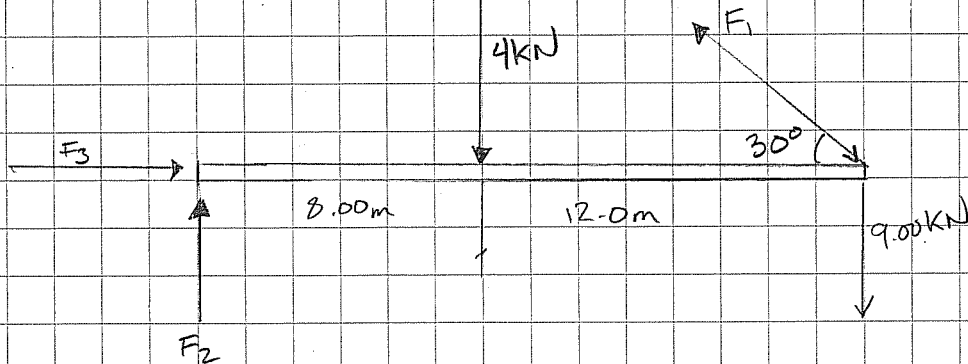
1)



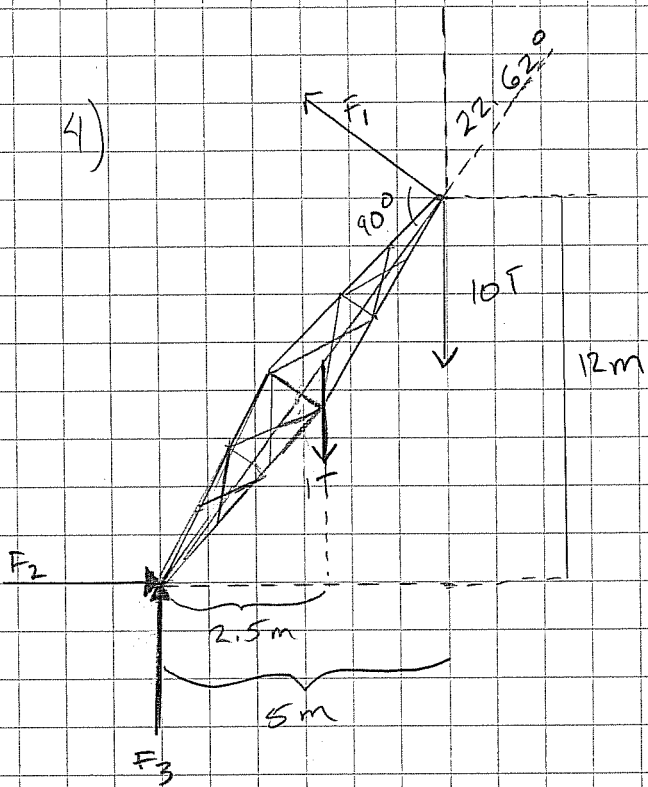
2)



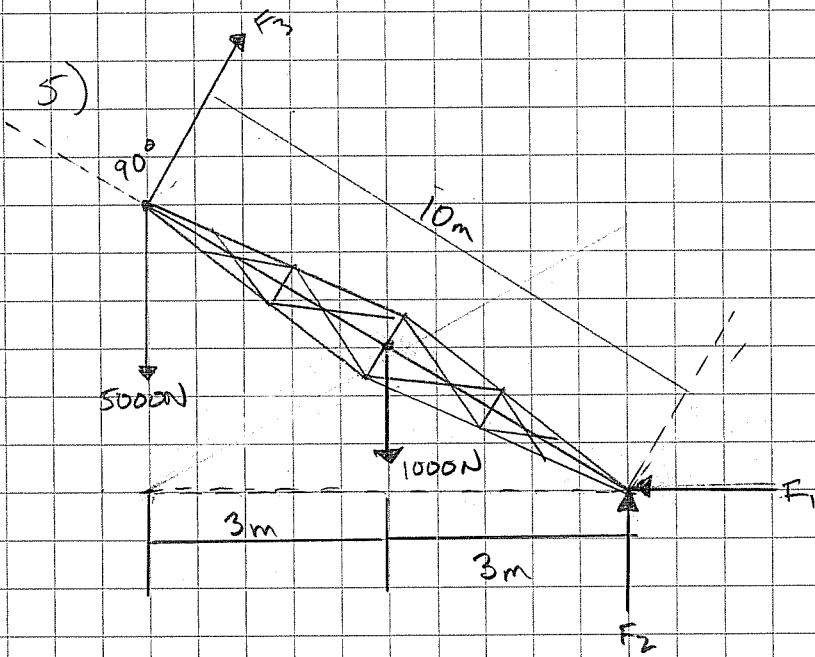
3)



4)



5)



SOLUTIONS

1)  $\vec{\sigma}_M = \vec{\sigma}_M$   
 $6F_2 + 9F_3 = 5F_1 + (1)(12)$   
 $6F_2 + 9F_3 = 5F_1 + 12$

$\vec{\sigma}_M = \vec{\sigma}_M$   
 $(8)(10) = 3F_3 + F_2$   
 $80 = 3F_3 + F_2$

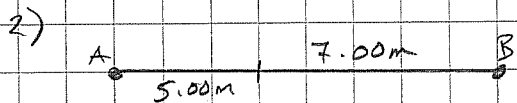
$\vec{\sigma}_M = \vec{\sigma}_M$   
 $(1)(15) + 8F_3 = (1)F_2 + 4F_1$   
 $15 + 8F_3 = F_2 + 4F_1$

$\therefore -5F_1 + 6F_2 + 9F_3 = 12 \quad \xrightarrow{\times 4} \quad -20F_1 + 24F_2 + 36F_3 = 48$   
 $F_2 + 3F_3 = 80 \quad \xrightarrow{\times 5} \quad 5F_2 + 15F_3 = 400$   
 $4F_1 + F_2 - 8F_3 = 15 \quad \xrightarrow{\times 5} \quad 20F_1 + 5F_2 - 40F_3 = 75$   
 $29F_2 - 4F_3 = 123$

$29F_2 - 4F_3 = 123 \quad \times 29 \quad 29F_2 - 4F_3 = 123$   
 $F_2 + 3F_3 = 80 \quad \Rightarrow \quad -(29F_2 + 87F_3 = 2320)$   
 $-91F_3 = -2197$   
 $F_3 = 24.1 \text{ N}$

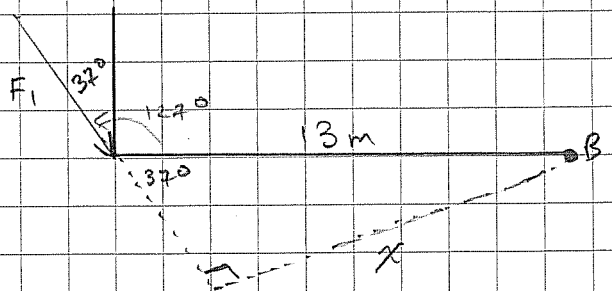
$80 = 3(24.1) + F_2$   
 $\therefore F_2 = 7.7 \text{ N}$

$4F_1 + 7.7 - 8(24.1) = 15$   
 $4F_1 = 200.1$   
 $F_1 = 50.0 \text{ N}$



@ A  $\vec{\sigma}_M = \vec{\sigma}_M$   
 $(5.00)(4.00) = 13F_3$   
 $F_3 = 1.54 \text{ N}$

@ B



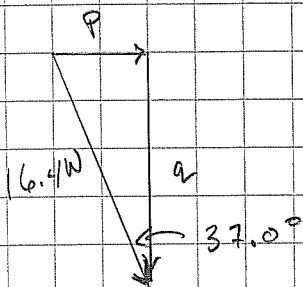
$\therefore x = 13 \sin 37^\circ = 7.82 \text{ m}$

$$\therefore \vec{OM} = \vec{OM}$$

$$(13)(12) = (7)(4) + (7.82)F_1$$

$$128 = 7.82F_1$$

$$F_1 = \underline{16.4 \text{ N}}$$



$$\therefore p = 16.4 \sin 37.0^\circ = 9.87 \text{ N}$$

$$a = 16.4 \cos 37.0^\circ = 13.1 \text{ N}$$

$$\therefore \underline{F_V}$$

$$12.0 + F_3 = 4.00 + 13.1$$

$$F_3 = \underline{5.1 \text{ N}}$$

$$\underline{F_H}$$

$$3.00 + 9.87 = F_3$$

$$F_3 = \underline{12.87 \text{ N}}$$

$$3) \quad \vec{OM} = \vec{OM}$$

$$F_1(13) = 10(5) + 1(2.5)$$

$$F_1 = \underline{4.04 \text{ T}}$$

$$\underline{F_V}$$

$$F_3 + F_1 \sin 22.62^\circ = 11$$

$$F_3 = 11 - 4.04 \sin 22.62^\circ$$

$$= \underline{9.45 \text{ T}}$$

$$\underline{F_H}$$

$$F_2 = F_1 \cos 22.62^\circ$$

$$= 4.04 \cos 22.62^\circ$$

$$= \underline{3.50 \text{ T}}$$

$$4) \quad \text{ANSWERS}$$

$$F_3 = 3300 \text{ N}$$

$$F_1 = 2640 \text{ N}$$

$$F_2 = 4040 \text{ N}$$