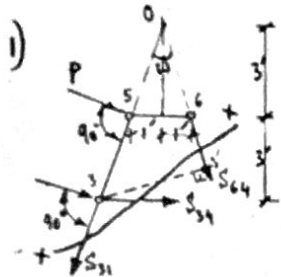


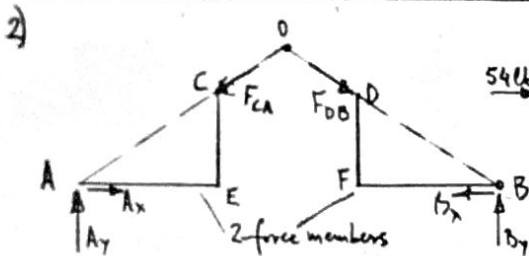
ENGR 242/4 - J Test #3 SOLUTIONS



$$(\sum M)_O = 0 = S_{34} \times 6 + P\sqrt{10} + P2\sqrt{10} \Rightarrow \underline{S_{34} = -1.58 P (C)}$$

$$(\sum M)_3 = 0 = S_{64} \times (33') + P\sqrt{10} = S_{64} \times 3.8' + P\sqrt{10} \Rightarrow \underline{S_{64} = -0.83 P (C)}$$

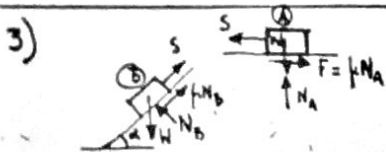
$$(33') = (03') \sin \omega = 2\sqrt{10} \sin \left(2 \arctan \frac{1}{3} \right) = 3.8'$$



Member GCDH: $\sum M_O = 0 = R_H \times 4.5 - 54(4.5 + 1) \Rightarrow \underline{R_H = 66 lb}$

Entire frame: $\sum M_B = 0 = A_y \times 9 - 54 \times 9 + 54 \times 2 \Rightarrow \underline{A_y = 42 lb}$
 $\sum F_y = 0 = A_y - 54 - 66 + B_y \Rightarrow \underline{B_y = 78 lb}$

Member AEC: $\sum M_C = 0 = A_x \times 2 - A_y \times 3 \Rightarrow \underline{A_x = 42 \times 3 / 2 = 63 lb}$; Entire frame: $\underline{B_x = 63 + 54 = 117 lb}$



Block A: $S = \mu N_A = \mu W$

Block B: $S - W \sin \alpha + \mu N_B = 0$
 $N_B = W \cos \alpha$

$$\Rightarrow \mu W - W \sin \alpha + \mu W \cos \alpha = 0$$

$$\therefore \mu = \frac{\sin \alpha}{1 + \cos \alpha} = \frac{2 \tan \frac{\alpha}{2}}{1 + \frac{1 - \tan^2 \frac{\alpha}{2}}{1 + \tan^2 \frac{\alpha}{2}}} =$$

$$= \frac{2 \tan \frac{\alpha}{2}}{2} = \tan \frac{\alpha}{2} = \mu$$

PLEASE LEARN FROM YOUR MISTAKES !!!

DICK!