IV. MATHEMATICAL TRUSS ANALYSIS

Internal Forces

We immediately see that bK, cK, eh, and fh are zero force members

joint a : $F_{ab}\sin(45) = F_p \cdot n_y$

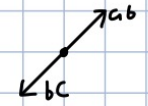
$F_{ab} = 358.2\ N$

$F_{aK} = F_{ab}\cos(45)$

$F_{aK} = 253.3 N$

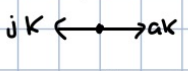
joint b : $F_{ab} = F_{bc}$

$F_{bc} = 358.2\ N$



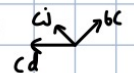
joint K : $F_{jK} = F_{aK}$

$F_{jK} = 253.3 N$



joint C : $F_{cj}\sin(45) = F_{bc}\sin(45)$

$F_{cj} = 358.2\ N$

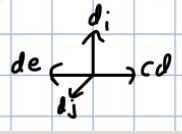


: $F_{cd} = F_{bc}\sin(45) + F_{cj}\sin(45)$

$F_{cd} = 506.6\ N$

joint d : $F_{dj}\sin(45) = F_{di}$

$F_{dj} = 199.0$

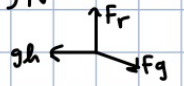


joint g : $F_{Fg} \cdot \frac{5}{\sqrt{89}} = F_{roller}$

$F_{Fg} = 265.5 N$

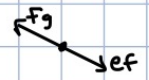
: $F_{gh} = F_{Fg} \cdot \frac{8}{\sqrt{89}}$

$F_{gh} = 225.1 N$



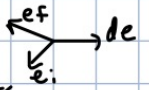
joint f : $F_{Fg} = F_{ef}$

$F_{ef} = 265.5 N$



joint e : $F_{ei}\sin(45) = F_{ef} \cdot \frac{5}{\sqrt{89}}$

$F_{ei} = 199.0\ N$

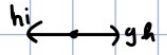


: $F_{de} = F_{ei}\cos(45) + F_{ef} \cdot \frac{8}{\sqrt{89}}$

$F_{de} = 365.9\ N$

joint h : $F_{hi} = F_{gh}$

$F_{hi} = 225.1\ N$



joint i : $F_{di} = F_{ei}\sin(45)$

$F_{di} = 140.7\ N$

: $F_{ij} = F_{ei}\cos(45) + F_{hi}$

$F_{ij} = 365.8\ N$