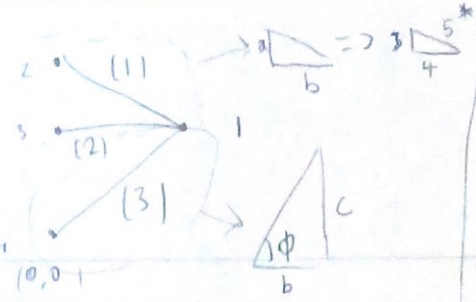
3)



$C = b \tan\phi$

Node 1 $f_1^{(1)}$ $f_1^{(2)}$ $f_1^{(3)}$ R_{1y} (no R_{1x}, roller)

$\Sigma F_y = 0 = f_1^{(3)} \sin\phi - f_1^{(1)} \sin\alpha - R_{1y}$

$R_{1y} = f_1^{(3)} \sin\phi - f_1^{(1)} \sin\alpha$

$= 9163 \sin 60° - 23458 \left(\frac{3}{5}\right)$

$= -6139.4\ N$

$\approx -6.14\ kN\ (\uparrow)$

Part 4)

Node 3

$R_{3x} \rightarrow \bullet \leftarrow f_3^{(2)}$

$\uparrow R_{3y}$

$\Sigma F_x = 0 = R_{3x} - f_3^{(2)}$ $\quad R_{3x} = f_3^{(2)}$

$= 36652\ N$

$\approx 36.7\ kN\ (\rightarrow)$

$\Sigma F_y = 0 = R_{3y}$

Node 2

$R_{3x} \rightarrow \bullet \leftarrow f_2^{(1)}$ (α)

$\uparrow R_{3y}$

note*: $\cos\alpha = \frac{4}{5}$ $\quad \sin\alpha = \frac{3}{5}$

* replace R_3 with R_2, bolt track

$\Sigma F_x = 0 = R_{3x} - f_2^{(1)} \cos\alpha$, $\quad R_{3x} = f_2^{(1)} \cos\alpha$

$R_{3x} = 18766.4\ N$ $\quad = 23458 \cdot \frac{4}{5}$

$\approx 18.8\ kN\ (\rightarrow)$

$\Sigma F_y = 0 = R_{3y} + f_2^{(1)} \sin\alpha$, $\quad R_{3y} = -f_2^{(1)} \sin\alpha = -23458 \cdot \frac{3}{5}$

$= -14074.8\ N\ (\downarrow)$

$\approx -14.1\ kN$

node 4

$f_4^{(3)}$ (ϕ)

$R_{4x} \rightarrow \bullet$

$\uparrow R_{4y}$

$\Sigma F_x = 0 = R_{4x} - f_4^{(3)} \cos\phi$, $\quad R_{4x} = f_4^{(3)} \cos\phi$

$= 9163 \cos 60°$

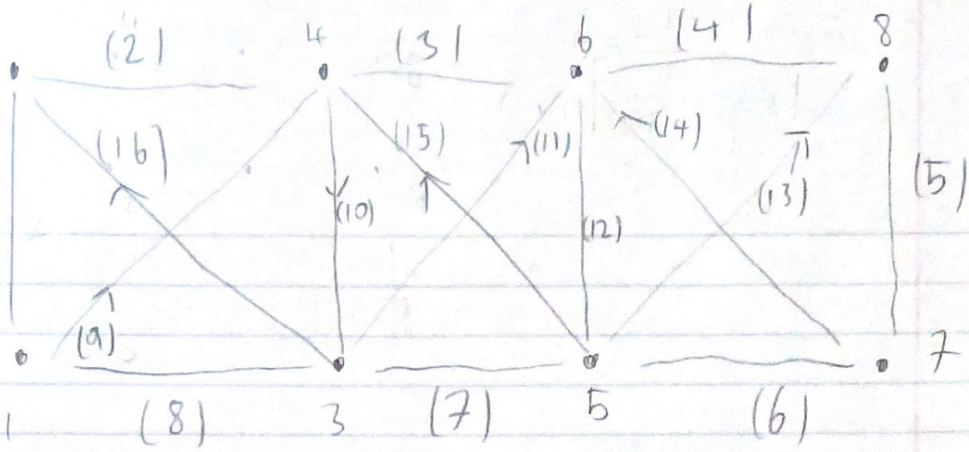
$= 4581.5\ N$

$\approx 4.58\ kN\ (\rightarrow)$

$\Sigma F_y = 0 = R_{4y} - f_4^{(3)} \sin\phi$, $\quad R_{4y} = f_4^{(3)} \sin\phi = 9163 \sin 60°$

$= 7935.4\ N$

$\approx 7.94\ kN\ (\uparrow)$



1	1, 2
2	2, 4
3	4, 6
4	6, 8
5	7, 8
6	5, 7
7	3, 5
8	1, 3
9	1, 4
10	3, 4
11	3, 6
12	5, 6
13	5, 8
14	7, 6
15	5, 4
16	3, 2

2) node 1

$R_{1x} \rightarrow \bullet \leftarrow f_1^{(1)}$ $\quad \Sigma F_x = 0 = R_{1x} - f_1^{(1)}$

$R_{1x} = f_1^{(1)} = 1066.7 \text{ N} \quad (\rightarrow)$

node 3

$f_{3x}^{(2)} \leftarrow \bullet \leftarrow R_{3x}$ $\quad \Sigma F_x = 0 = -f_{3x}^{(2)} - R_{3x}$

$R_{3x} = -f_{3x}^{(2)} = -933.3 \text{ N} \quad (\rightarrow)$