

Course No. CE 1023

Assignment No.

Date

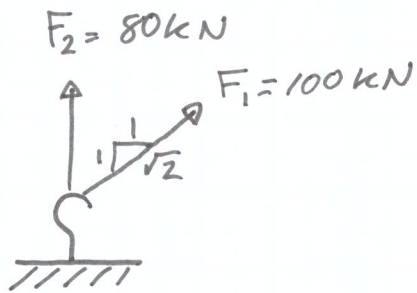
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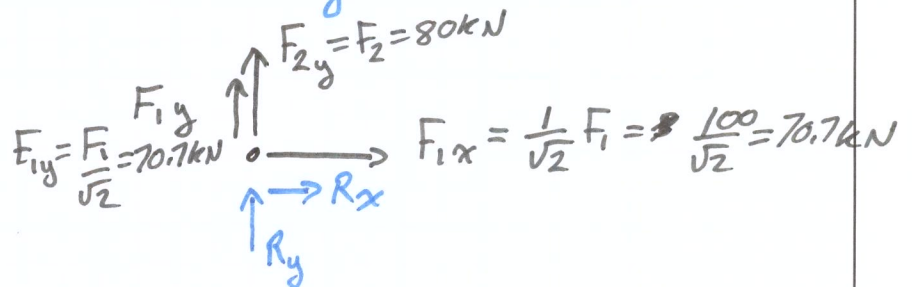
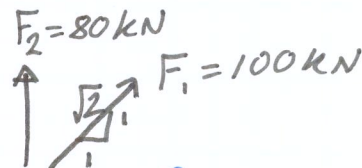
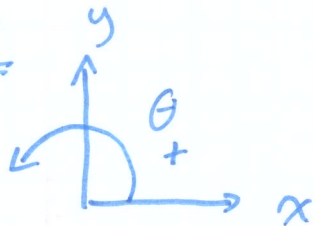
Problem No. Particle EquilibriumBy ALAN LLOYD

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FIND MAGNITUDE AND DIRECTION OF REACTIONS

1) DRAW THE FBDRecall:2) Apply Equilibrium

$$\sum F_x = 0$$

$$\sum F_y = 0$$

$$\sum F_x = 0 \rightarrow F_{1x} + R_x = 0$$

$$R_x = -F_{1x} = -70.7 \text{ kN}$$

$$\sum F_y = 0 \rightarrow F_{1y} + F_{2y} + R_y = 0$$

$$70.7 + 80 + R_y = 0$$

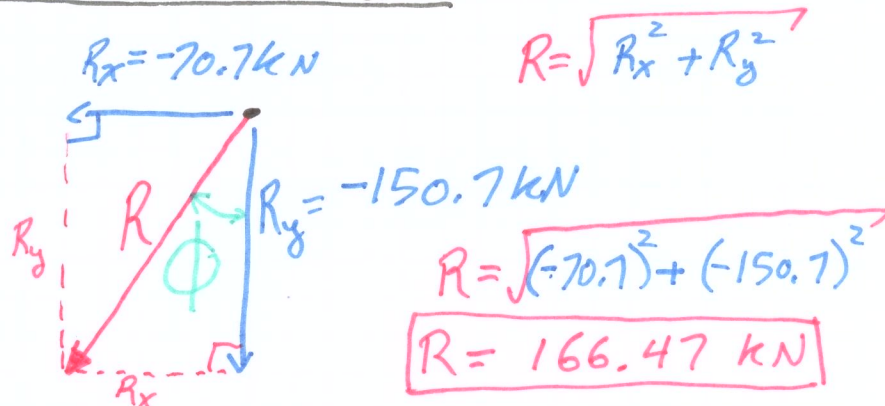
$$R_y = -150.7 \text{ kN}$$

3) DRAW REACTION COMPONENTS

$$\phi = \tan^{-1} \left| \frac{R_x}{R_y} \right|$$

$$\phi = \tan^{-1} \left| \frac{-70.7}{-150.7} \right|$$

$$\phi = 25.1^\circ$$



$$R = \sqrt{R_x^2 + R_y^2}$$

$$R = \sqrt{(-70.7)^2 + (-150.7)^2}$$

$$R = 166.47 \text{ kN}$$

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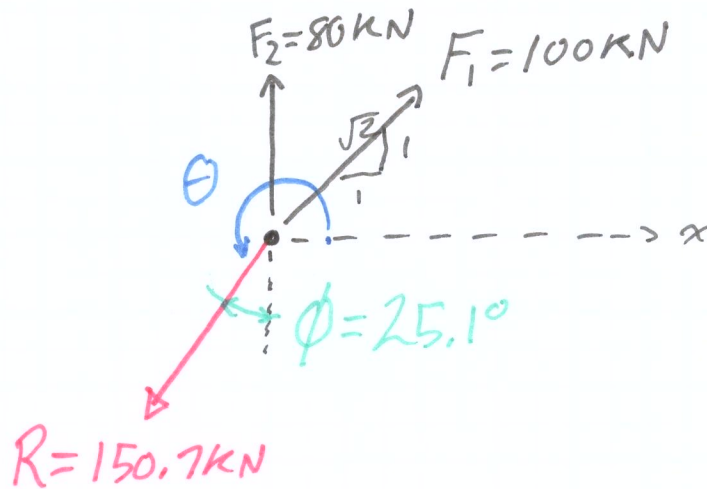
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4) DRAW ~~THE~~ SUMMARY

$$\theta = 270^\circ - \phi = 270^\circ - 25.1^\circ = \cancel{\theta}$$

$\theta = 244.9^\circ$

