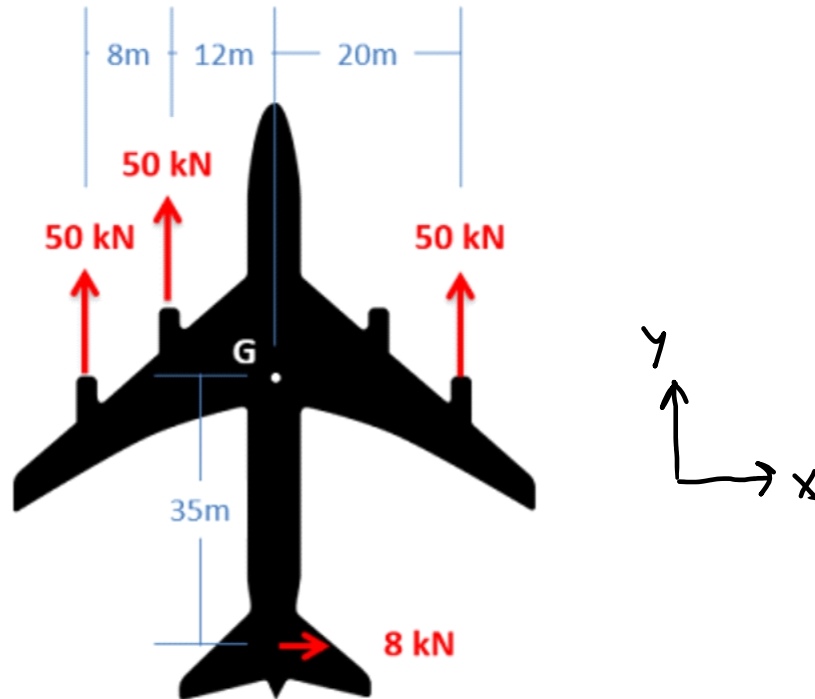


### Problem 3

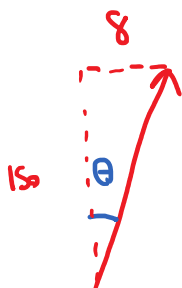
An engine on an airplane fails mid-flight. The pilot tries to compensate using the rudder at the back of the tail. Find the equivalent force couple system about point G for the set of forces shown on the plane.



$$\sum F_x = \underline{8 \text{ kN}}$$

$$\sum F_y = 50 + 50 + 50 = \underline{150 \text{ kN}}$$

$$\sum M_G = -(50)(20) - (50)(12) + (50)(20) + (8)(35) = \underline{-320 \text{ kN}\cdot\text{m}}$$



$$F = \sqrt{150^2 + 8^2} = 150.21 \text{ kN}$$

$$\theta = \tan^{-1}\left(\frac{8}{150}\right) = 3.05^\circ$$

Solution :

