

Problem 2.

Set $T_A = T_B = T_C = 50$.

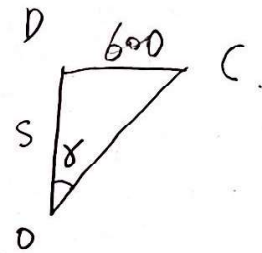
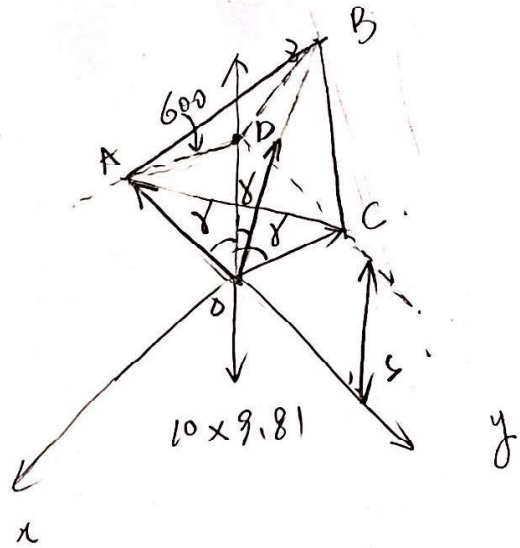
$$\sum F_z = 0 \quad \uparrow +$$

$$3 \times (50 \cos \gamma) - 98.1 = 0$$

$$\gamma = \cos^{-1} \frac{98.1}{150} = 49.16^\circ$$

$$\tan 49.16 = \frac{600}{S}$$

$$S = 519 \text{ mm}$$



Problem 3.

$$T_{Dx} = T_D \cos 120^\circ = -\frac{T_D}{2}$$

$$T_{Dy} = (-T_D \cos 60^\circ) = -\frac{1}{2} T_D$$

$$T_{Dz} = T_D \cos 45^\circ = \frac{\sqrt{2}}{2} T_D$$

$$T_{Cz} = T_C \sin 60^\circ$$

$$T_{Cy} = (T_C \cos 60^\circ) \cos 30^\circ$$

$$T_{Cx} = -(T_C \cos 60^\circ) \sin 30^\circ$$

$$\sum F_x = 0.$$

$$T_{Dx} + T_{Cx} + T_B = 0.$$

$$-\frac{T_D}{2} - \frac{T_C}{4} + T_B = 0.$$

$$\sum F_y = 0.$$

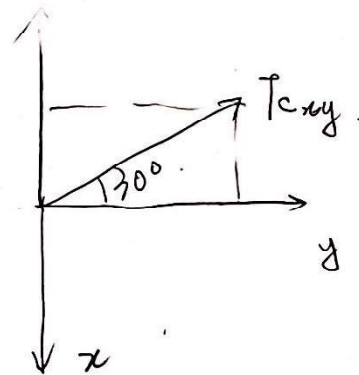
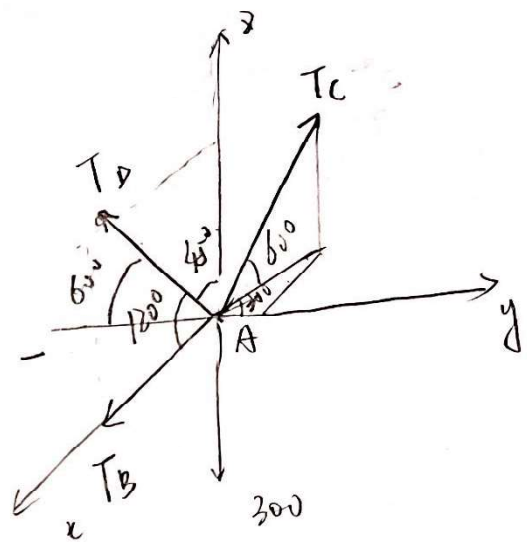
$$T_{Dy} + T_{Cy} = 0.$$

$$-\frac{1}{2} T_D + \frac{\sqrt{3}}{4} T_C = 0.$$

$$\sum F_z = 0$$

$$T_{Dz} + T_{Cz} - 300 = 0.$$

$$\frac{\sqrt{2}}{2} T_D + \frac{\sqrt{3}}{2} T_C - 300 = 0.$$



$$T_D = 176 \text{ lb}$$

$$T_C = 203 \text{ lb}$$

$$T_B = 139 \text{ lb}.$$

3.