5.69 Compute the reactions at the ball and socket support at point \( D \) and the tensions in the support ropes \((T_1 \text{ and } T_2)\) for the sign support system. The weight of the sign exerts a force of 300 N in the down direction \((-y)\) at point \( E \), 0.25 m from \( D \) and at point \( F \), 1.75 m from \( D \). Note that \( DC \) is not constrained from rotation about its axis.

![Diagram](image)

**FIGURE P5.69**

Solution: A free body diagram of the sign support is given in the figure

![Free Body Diagram](image)

**FIGURE S5.69**

First note that all the forces intersect a common axis (that of the (continued)