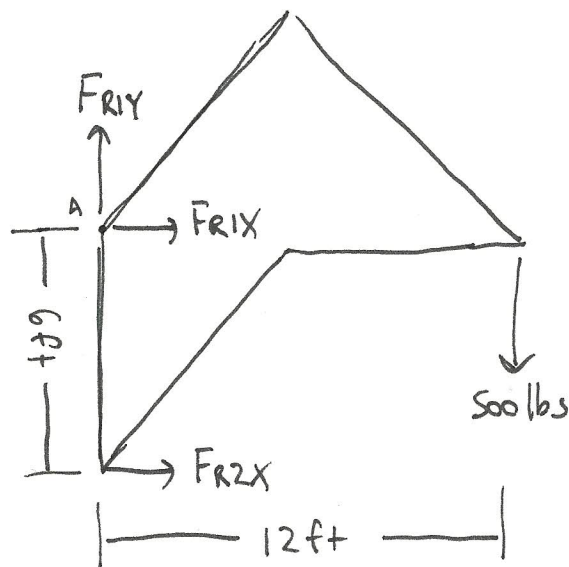
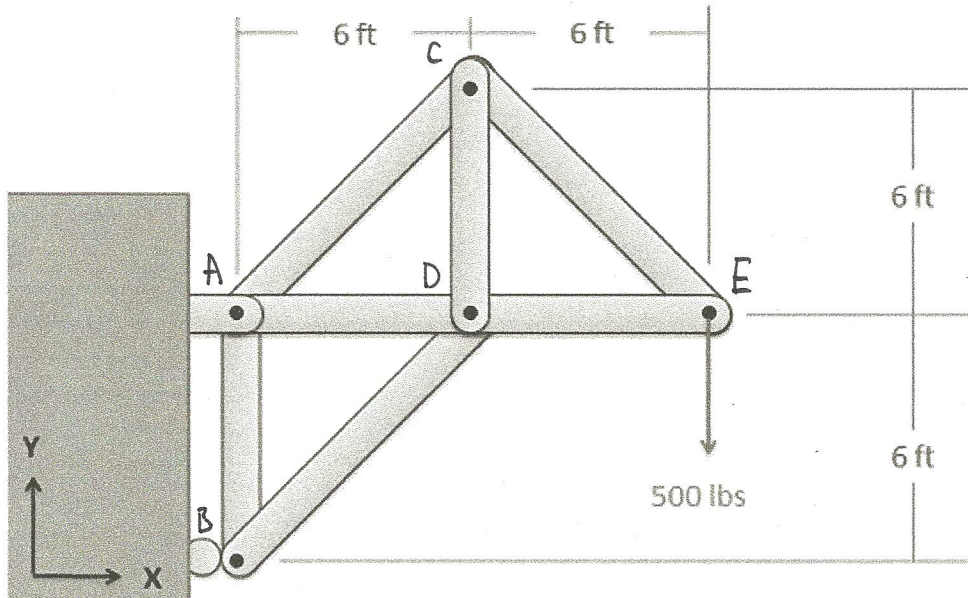


Question 2:

Find the force acting in each of the members of the truss shown below. Remember to specify if each member is in tension or compression.



$$\sum F_x = F_{R1X} + F_{R2X} = 0$$

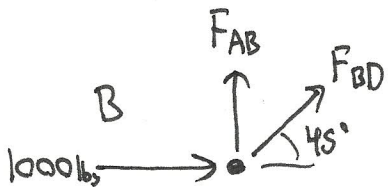
$$\sum F_y = F_{R1Y} - 500 = 0$$

$$\sum M_A = (F_{R2X})(6) - (500)(12) = 0$$

$$F_{R1X} = 500 \text{ lbs}$$

$$F_{R2X} = \frac{(500)(12)}{6} = 1000 \text{ lbs}$$

$$F_{R1X} = -1000 \text{ lbs}$$

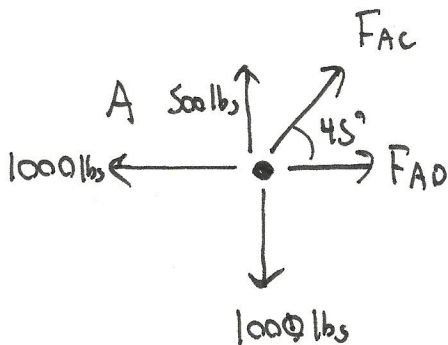


$$\sum F_x = 1000 + \cos(45) F_{BD} = 0$$

$$\sum F_y = F_{AB} + \sin(45) F_{BD} = 0$$

$$F_{BD} = \frac{-1000}{\cos(45)} = -1414.2 \text{ lbs}$$

$$F_{AB} = -\sin(45) (-1414.2) = 1000 \text{ lbs}$$

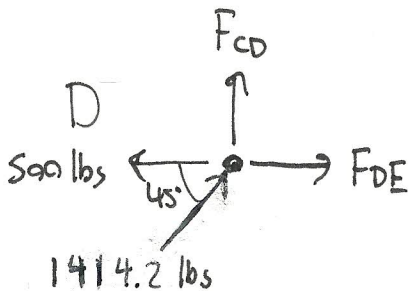


$$\sum F_x = F_{AD} + \cos(45) F_{AC} - 1000 = 0$$

$$\sum F_y = 500 - 1000 + \sin(45) F_{AC} = 0$$

$$F_{AC} = \frac{500}{\sin(45)} = 707.1 \text{ lbs}$$

$$F_{AD} = 1000 - \cos(45) (707.1) = 500 \text{ lbs}$$

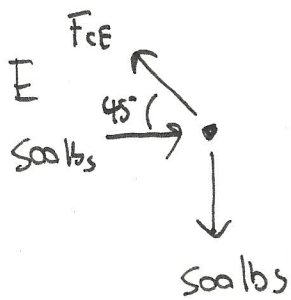


$$\sum F_x = 1414.2 \cos(45) - 500 + F_{DE} = 0$$

$$\sum F_y = F_{CD} + 1414.2 \sin(45) = 0$$

$$F_{DE} = 500 - \cos(45) 1414.2 = -500 \text{ lbs}$$

$$F_{CD} = -\sin(45) 1414.2 = -1000 \text{ lbs}$$



$$\sum F_y = F_{CE} \sin(45) - 500 = 0$$

$$F_{CE} = \frac{500}{\sin(45)} = 707.1 \text{ lbs}$$

Solution:

$$F_{AB} = 1000 \text{ lbs T}$$

$$F_{AC} = 707.1 \text{ lbs T}$$

$$F_{AD} = 500 \text{ lbs T}$$

$$F_{BD} = 1414.2 \text{ lbs C}$$

$$F_{CD} = 1000 \text{ lbs C}$$

$$F_{CE} = 707.1 \text{ lbs T}$$

$$F_{DE} = 500 \text{ lbs C}$$