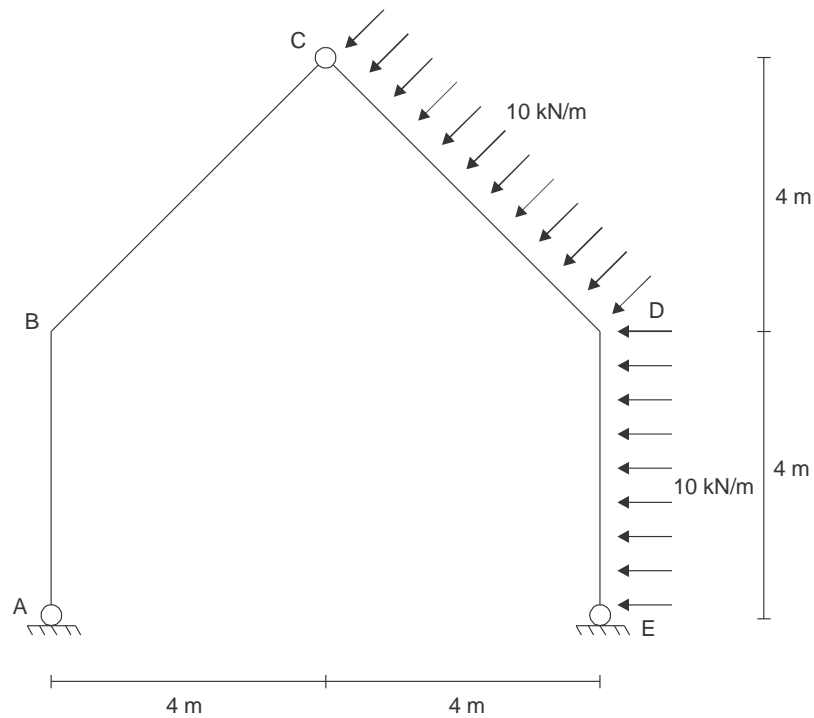


Nº USP: _____ Nome: _____

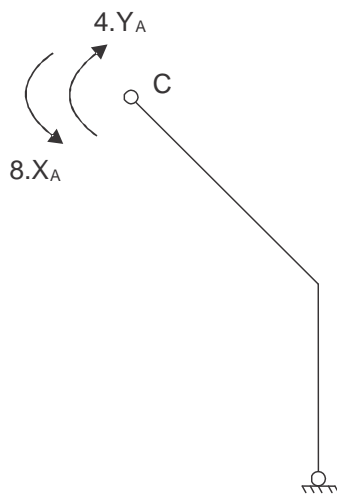
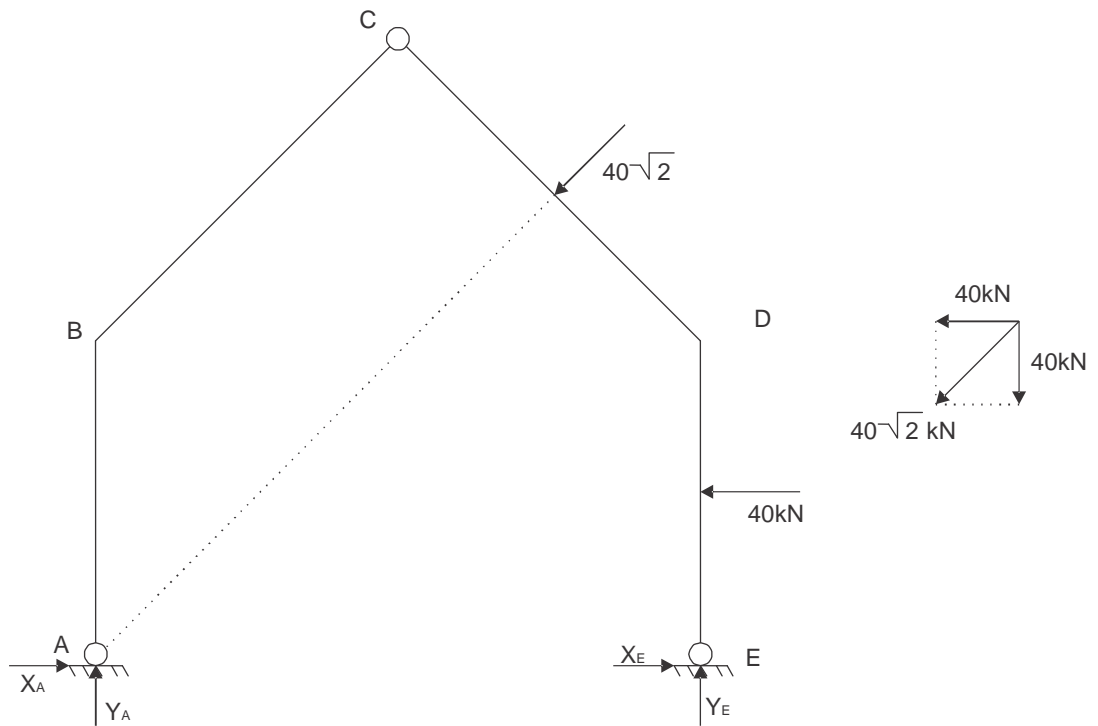
3ª Questão (3,5 pontos)

Para o galpão recebendo a carga de um vento de 10 kN/m conforme representado pela figura, determine:

- As reações de apoio;
- Os diagramas de esforços solicitantes na barra CDE indicando todos os valores relevantes.



Resolução:



$$\sum F_x = 0 = X_A + X_E - 40 - 40$$

$$\sum F_y = 0 = Y_A + Y_E - 40$$

$$\sum M_A = 0 = 8 \cdot Y_E + 40 \cdot 2$$

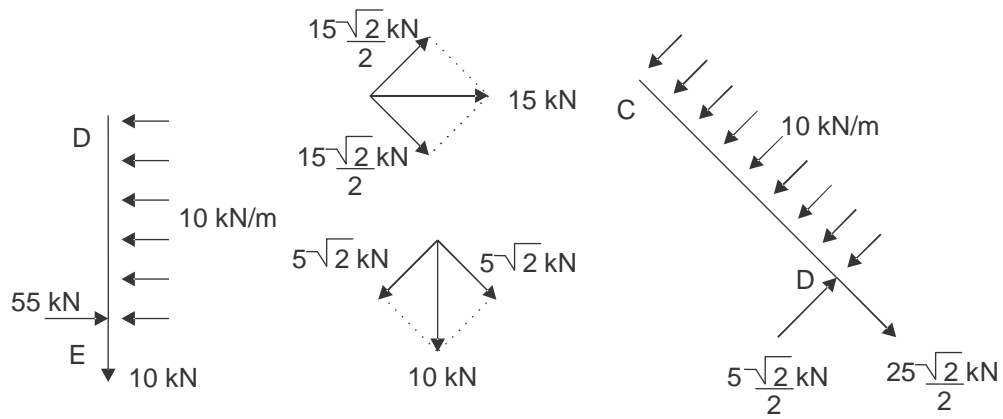
$$Y_E = -10 \text{ kN}$$

$$Y_A = 50 \text{ kN}$$

$$\sum M_C = 0 = -4 \cdot Y_A + 8 \cdot X_A$$

$$X_A = 25 \text{ kN}$$

$$X_E = 55 \text{ kN}$$



Trecho DE:

$$M(x) = 55 \cdot x - 5x^2$$

$$M(4) = 55 \cdot 4 - 5(4)^2 = 140 \text{ kN} \cdot \text{m}$$

Trecho CD:

$$M(x) = 140 + \frac{5\sqrt{2}}{2} \cdot x - 5x^2$$

$$V(x) = 0 \rightarrow \frac{5\sqrt{2}}{2} - 10x = 0 \rightarrow x = \frac{\sqrt{2}}{4} \text{ m}$$

$$M\left(\frac{\sqrt{2}}{4}\right) = 140 + \frac{5\sqrt{2}}{2} \cdot \frac{\sqrt{2}}{4} - 5\left(\frac{\sqrt{2}}{4}\right)^2 = 140,625 \text{ kN} \cdot \text{m}$$

