

Title

salma ¹

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P4-5. The rigid beam supports the load of 60 kN. Determine the displacement at *B*. Take $E = 60$ GPa, and $A_{BC} = 2 (10^{-3}) \text{ m}^2$.

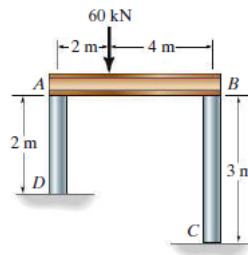


Figure 1: This is a caption

$$\Sigma F_y = 0$$

$$f_A - 60 \text{ KN} + F_B = 0 \quad (1)$$

$$\Sigma M_0 = 0$$

$$(2\text{ m})(-60 \text{ KN}) + (6\text{ m})F_B = 0 \text{ Despejamos } F_B = \frac{60 \text{ KN}(2\text{ m})}{6\text{ m}} \quad F_B = 20 \text{ KN} \quad (3)$$

Sustituimos (3) en (1)

$$F_A - 60 \text{ KN} + 20 \text{ KN} = 0 \quad F_A = 40 \text{ KN}$$

Ahora calculamos los desplazamientos

$$S_A = \frac{(40 \times 10^3 \text{ N})(2 \text{ m})}{2(10^{-3}) \text{ m}^2 (60 \times 10^9 \text{ Pa})} = 80,000 = 0.666 \times 10^{-3}$$

$$S_B = \frac{(20 \times 10^3 \text{ N})(4 \text{ m})}{2(10^{-3}) \text{ m}^2 (60 \times 10^9 \text{ Pa})} = 20,000 = 1.666 \times 10^{-4}$$

