



**مدرس خصوصى**



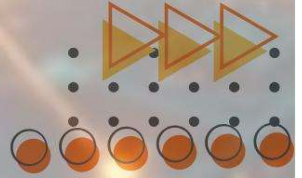
**اونلاين**

**يحصل الطالب على ...**

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**للتواصل**



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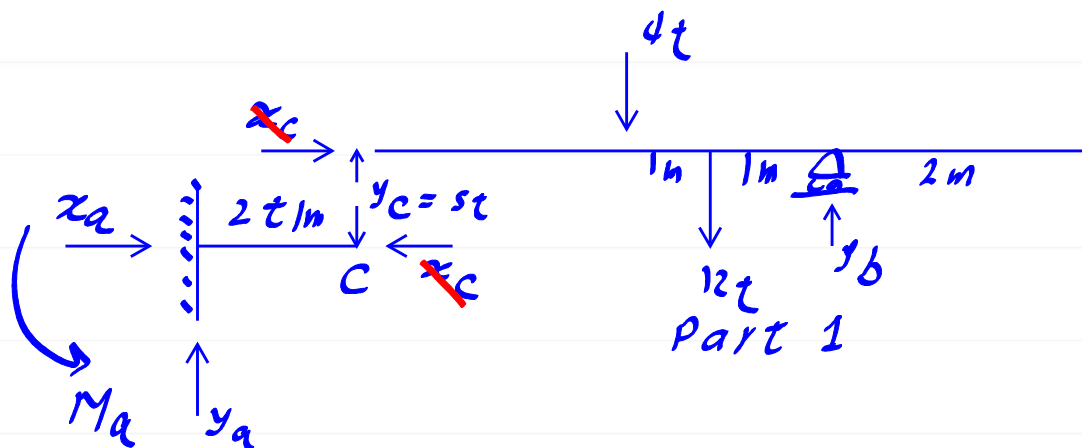
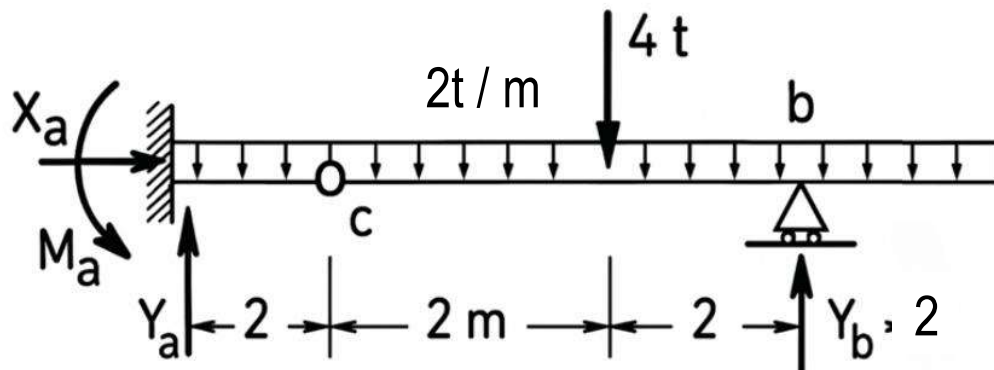


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## Example 2.8

Determine the reactions of the structure shown in Fig. 2.11 a.



for part 1

$$\sum f_x = X_c = 0$$

$$\sum M_c = -1 \times 2 - 12 \times 3 + Y_b \times 4 = 0$$

$$Y_b = 11t \uparrow$$

$$\sum f_y = Y_c - 4 - 12 + 11 = 0$$

$$Y_c = 5t \uparrow$$

for part 2

$$\sum f_x \Rightarrow X_a = 0$$

$$\sum f_y = Y_a - 4 - 5 = 0$$

$$Y_a = 9t \uparrow$$

$$\sum M_a = M_a - 4 \times 1 - 5 \times 2 = 0$$

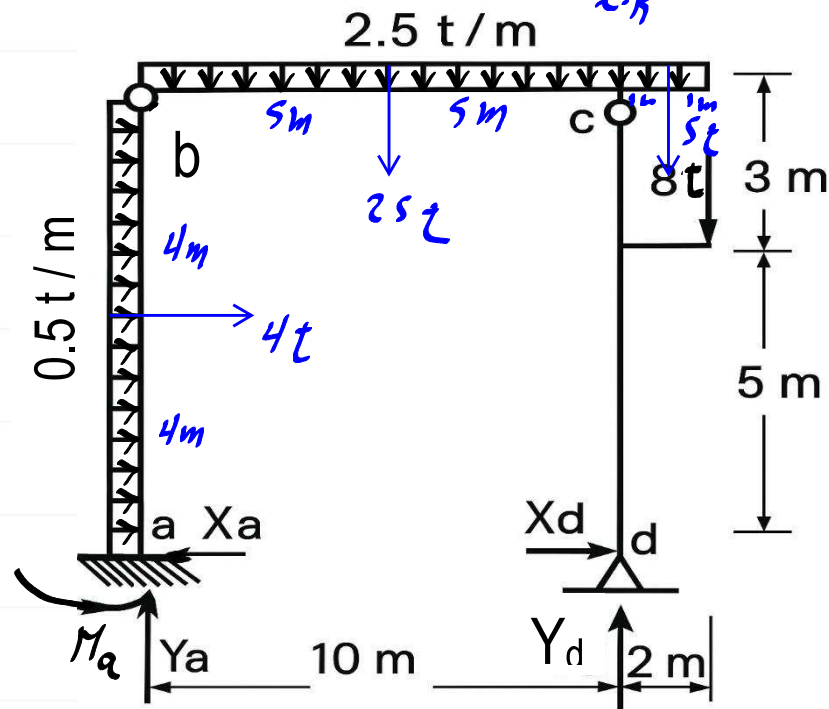
$$M_a = 14t \text{ m}$$

## Example 2.10

The frame abcd is fixed at a and hinged at d, and has two intermediate hinges at b and c as shown in Fig. 2.13.

Determine its reactions under the given vertical and horizontal loads.

$$\sum f_x = 0, \sum f_y = 0, \sum M = 0, \sum M_{b.l.R} = 0, \sum M_{c.l.R} = 0$$



$$\sum_c M_c = -8 \times 2 + x_d \times 8 = 0 \Rightarrow x_d = 2t \rightarrow$$

$$\sum f_x = -x_a + 4 + 2 = 0 \Rightarrow x_a = 6t \leftarrow$$

$$\sum_b M_b = 4 \times 4 - 6 \times 8 + M_a = 0 \Rightarrow M_a = 32t \cdot m \curvearrowright$$

$$\sum_b M_b = -25 \times 5 - 5 \times 11 - 8 \times 12 + 2 \times 8 + y_d \times 10 = 0$$

$$y_d = 26t \uparrow$$

$$\sum f_y = y_a - 25 - 5 - 8 + 26 = 0$$

$$y_a = 12t \uparrow$$

check

## Example 2.11

Determine the reactions of the frame shown in figure.

$$\sum f_x = 0, \sum f_y = 0, \sum M = 0, \sum M_{C.L.R} = 0, \sum M_{d.l.R} = 0$$

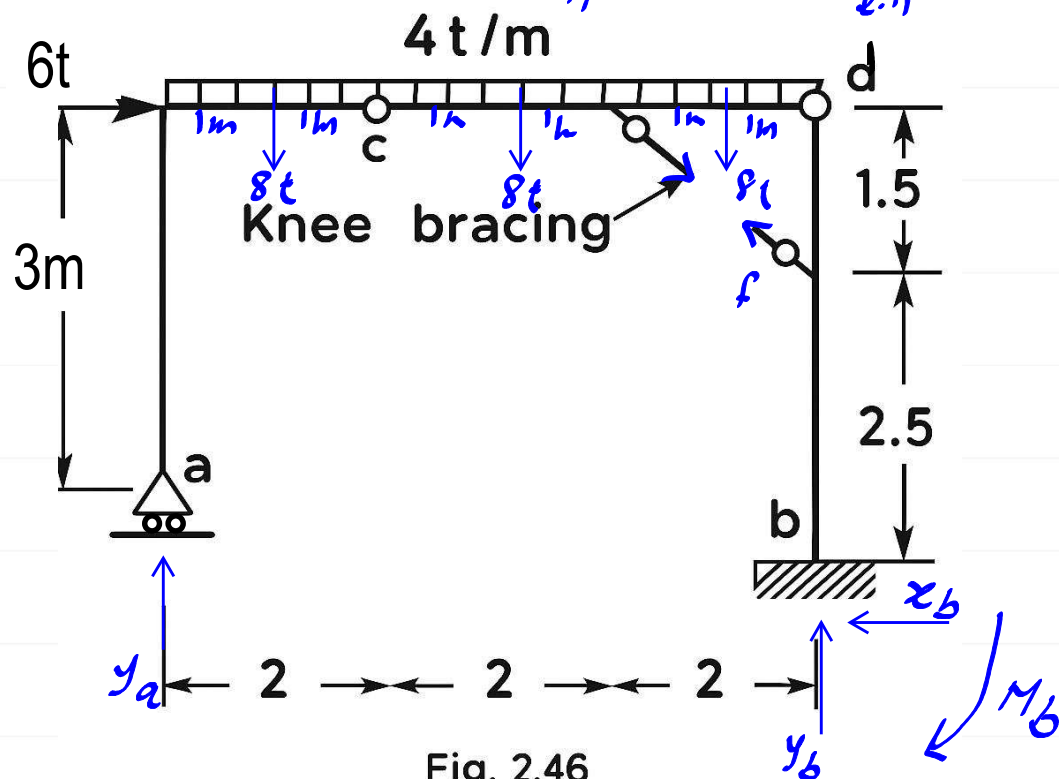


Fig. 2.46

$$\sum f_x = 6 - x_b = 0 \Rightarrow x_b = 6t \leftarrow$$

$$\sum M_C = 8 \times 1 - y_a \times 2 = 0 \Rightarrow y_a = 4t \uparrow$$

$$\sum f_y = 4 - 8 - 8 - 8 + y_b = 0 \Rightarrow y_b = 20t \uparrow$$

$$\sum M_C = -8 \times 1 - 8 \times 3 - 6 \times 4 + 20 \times 4 - M_b = 0$$

$$M_b = 24 t \cdot m$$

check