



مدرس خصوصى



اونلاين

يحصل الطالب على ...

* مقاطع فيديو هات لشرح المقرر بشكل وافي

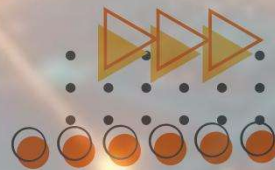
* ملخص للمادة للمراجعة النهائية

* محاضرات مباشرة على برنامج Zoom

* تواصل مستمر مع معلم المادة للمناقشة



للتواصل



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00201096019763

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$$1 + \frac{270}{9} = \frac{y}{4} \quad \text{✓}$$

EXAMPLE 1.1

Determine the resultant internal loadings acting on the cross section at C of the cantilevered beam shown in Fig. 1-4a.

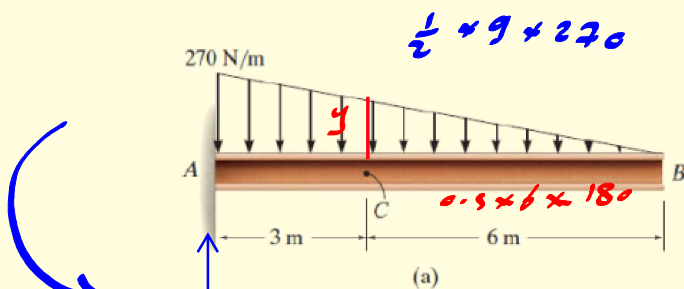
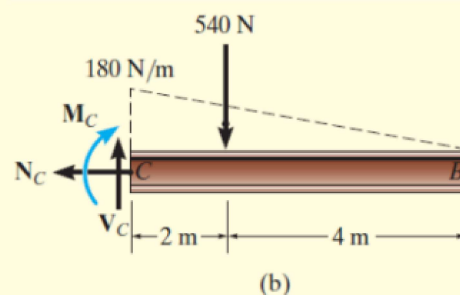


Fig. 1-4



$$M_A = 3645 \text{ N}\cdot\text{m} \quad y_A = 1215 \text{ N}$$

$$\sum F_x = 0 \Rightarrow \sum F_x = x_A = 0$$

$$\sum F_y = 0 \Rightarrow y_A - 1215 = 0 \Rightarrow y_A = 1215 \text{ N}$$

$$\sum M = 0 \Rightarrow \sum M_A = M_A - 1215 \times 3 = 0$$

$$M_A = 3645 \text{ N}\cdot\text{m} \quad \curvearrowright$$

$$\sum F_x = -N_C = 0$$

$$\sum F_y = V_C - 540 = 0$$

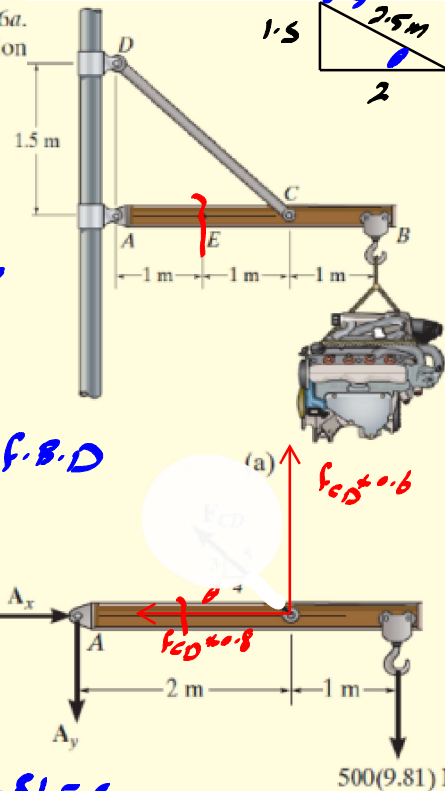
$$V_C = 540 \text{ N} \quad \uparrow$$

$$\sum M_C = -M_C - 540 \times 2 = 0$$

$$M_C = 1080 \text{ N}\cdot\text{m}$$

EXAMPLE 1.3

The 500-kg engine is suspended from the crane boom in Fig. 1-6a. Determine the resultant internal loadings acting on the cross section of the boom at point E.



$$\sin \theta = \frac{1.5}{2.5} = 0.6$$

$$\cos \theta = \frac{2}{2.5} = 0.8$$

$$\sum F_x = 0 \Rightarrow -A_x - F_{CD} \cos \theta = 0$$

$$\sum F_y = 0 \Rightarrow A_y + F_{CD} \sin \theta - 500 \times 9.81 = 0$$

$$\sum M = 0 \Rightarrow$$

$$\sum M_A = F_{CD} \sin \theta \times 2 - 500 \times 9.81 \times 3 = 0 \quad \text{f.B.D}$$

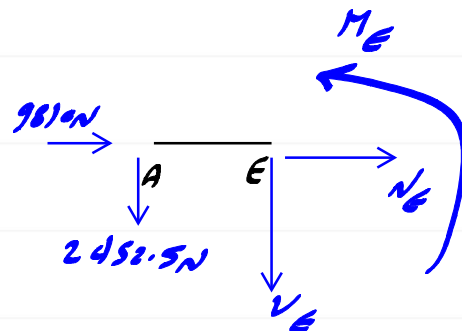
$$F_{CD} = 12262.5 \text{ N}$$

$$\sum F_x = -A_x - 12262.5 \times 0.8 = 0$$

$$A_x = -9810 \text{ N} \leftarrow = 9810 \text{ N} \rightarrow$$

$$\sum F_y = A_y + 12262.5 \times 0.6 - 500 \times 9.81 = 0$$

$$A_y = -2452.5 \text{ N} \uparrow = 2452.5 \text{ N} \downarrow$$



$$\sum F_x = 9810 \text{ N} + N_E = 0 \Rightarrow N_E = -9810 \text{ N} \rightarrow = 9810 \text{ N} \leftarrow$$

$$\sum F_y = V_E - 2452.5 = 0 \Rightarrow V_E = 2452.5 \text{ N} \uparrow$$

$$\sum M_A = -2452.5 \times 1 + M_E = 0 \Rightarrow M_E = 2452.5 \text{ N} \cdot \text{m}$$