The Method of Sections

- Also, the member forces acting on one part of the truss are equal but opposite to those acting on the other part—Newton’s third law.

Fig. 6–15
The Method of Sections

- If, however, the free-body diagram in Fig. 6–15c is considered, the three support reactions $D_x$, $D_y$, and $E_x$ will have to be known, because only three equations of equilibrium are available. (This, of course, is done in the usual manner by considering a free-body diagram of the entire truss.)
The Method of Sections

EXAMPLE 6.5

Determine the force in members GE, GC, and BC of the truss shown in Fig. 6–16a. Indicate whether the members are in tension or compression.

SOLUTION
Section abc in Fig. 6–16a has been chosen since it cuts through the three members whose forces are to be determined. In order to use the method of sections, however, it is first necessary to determine the external reactions at A or D. Why? A free-body diagram of the entire truss is shown in Fig. 6–16b. Applying the equations of equilibrium, we have

\[ \sum F_x = 0; \quad 400 \text{ N} - A_x = 0 \quad A_x = 400 \text{ N} \]

\[ \sum M_A = 0; \quad -1200 \text{ N}(8 \text{ m}) - 400 \text{ N}(3 \text{ m}) + D_y(12 \text{ m}) = 0 \]

\[ D_y = 900 \text{ N} \]

\[ \sum F_y = 0; \quad A_y - 1200 \text{ N} + 900 \text{ N} = 0 \quad A_y = 300 \text{ N} \]