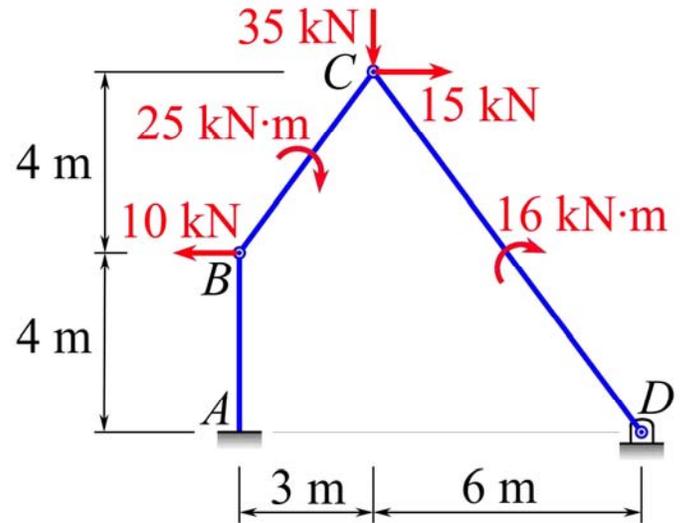


## MEEG 2003 Quiz #10.m17

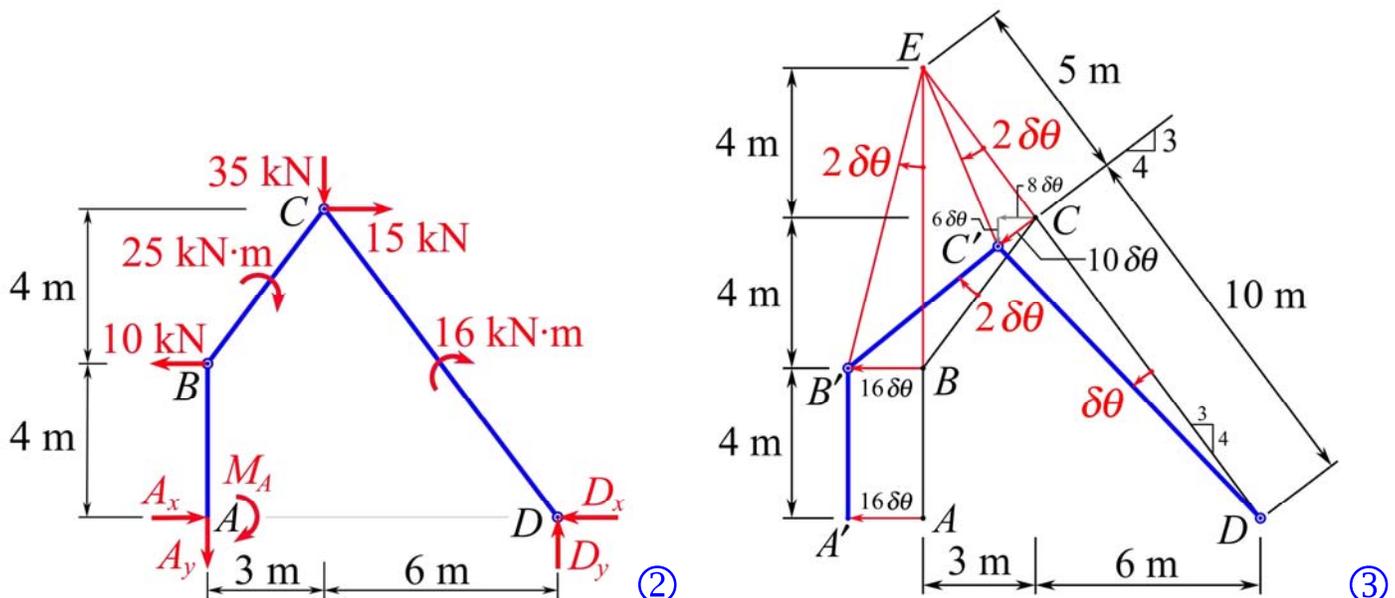
1. Define (a) work of a force on a body, (b) work of a moment on a body. ②

2. A frame is loaded as shown. Using *virtual work method*, determine the horizontal reaction force  $\mathbf{A}_x$  at the fixed support A. (Include the three major steps in your solution.) ⑧



1. (a) Work of a force on a body is equal to the force on the body times the displacement of the body in the direction of the force. (b) Work of a moment on a body is equal to the moment on the body times the angular displacement of the body in the direction of the moment. ②

2. We first draw the *FBD* and *VDD* with a strategy as follows:



Then, we set  $\delta U = 0$  to get

$$A_x(-16\delta\theta) + 10(16\delta\theta) + 25(2\delta\theta) + 15(-8\delta\theta) + 35(6\delta\theta) + 16(-\delta\theta) = 0$$

$$A_x = 17.75$$

$$\mathbf{A}_x = 17.75 \text{ kN} \rightarrow \text{③}$$