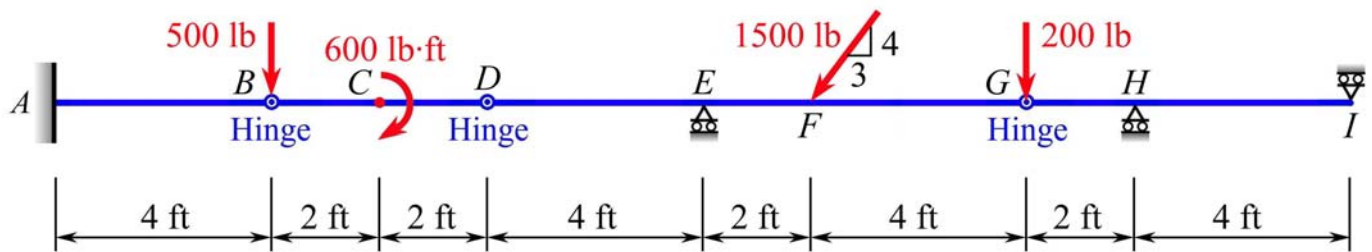
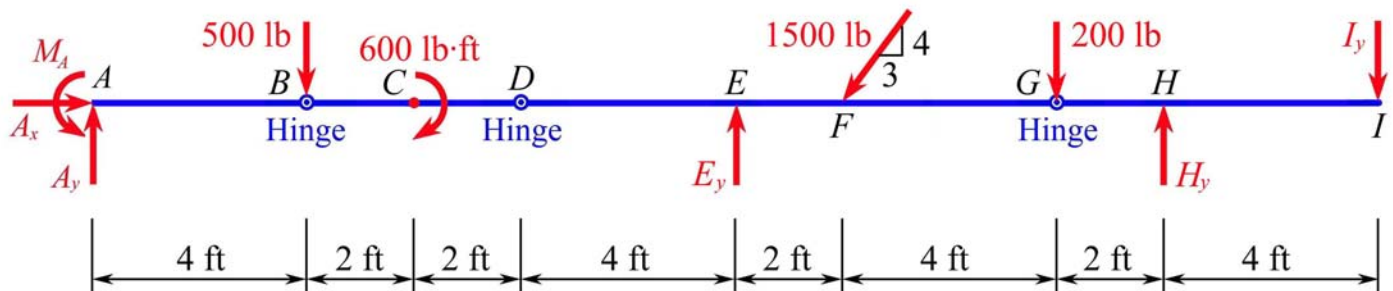


Quiz #10. Using the virtual work method, determine the vertical reaction force E_y at the roller support E of the *Gerber beam* shown.

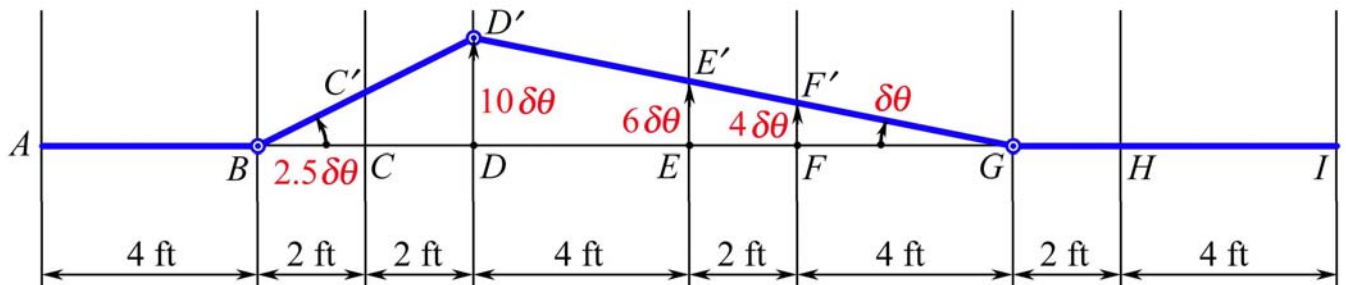


Solution.

Step 1: We draw the *FBD* for the beam.



Step 2: We draw the *VDD* for the beam with a **strategy** to involve E_y in the total virtual work done.



Step 3: We set $\delta U = 0$.

$$600(-2.5\delta\theta) + E_y(6\delta\theta) + \frac{4}{5}(1500)(-4\delta\theta) = 0$$

$$E_y = 1050$$

$$E_y = 1050 \text{ lb } \uparrow$$