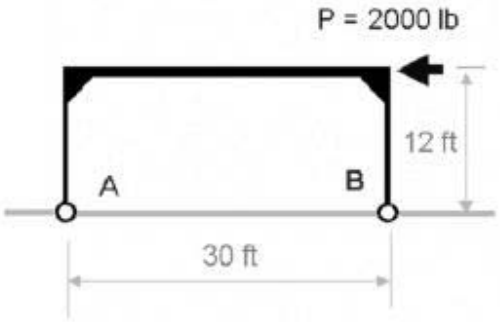
Examples:
Rigid Frames

Example 1 **From eStructures v1.1, Schodek and Pollalis, 2000 Harvard College**

Lateral Loading STEP 1 Next Example

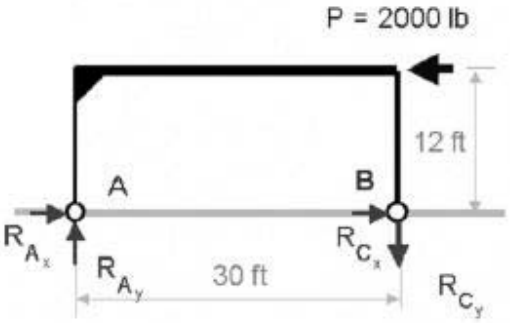
RIGID FRAME STRUCTURES: LATERAL LOADING
PINNED BASE CONNECTIONS



Determine axial forces, shear forces, and bending moments in each member of the rigid frame shown.

Lateral Loading STEP 2 Next Example

RIGID FRAME STRUCTURES



Assumed directions of reactions:
Horizontal components balance applied force
Vertical components act as shown to prevent overturning

DETERMINE REACTIONS

$\Sigma M_A = 0$

$+ 2000(12) - R_{C_y}(30) = 0$

$R_{C_y} = 800 \downarrow$

$\Sigma F_y = 0$

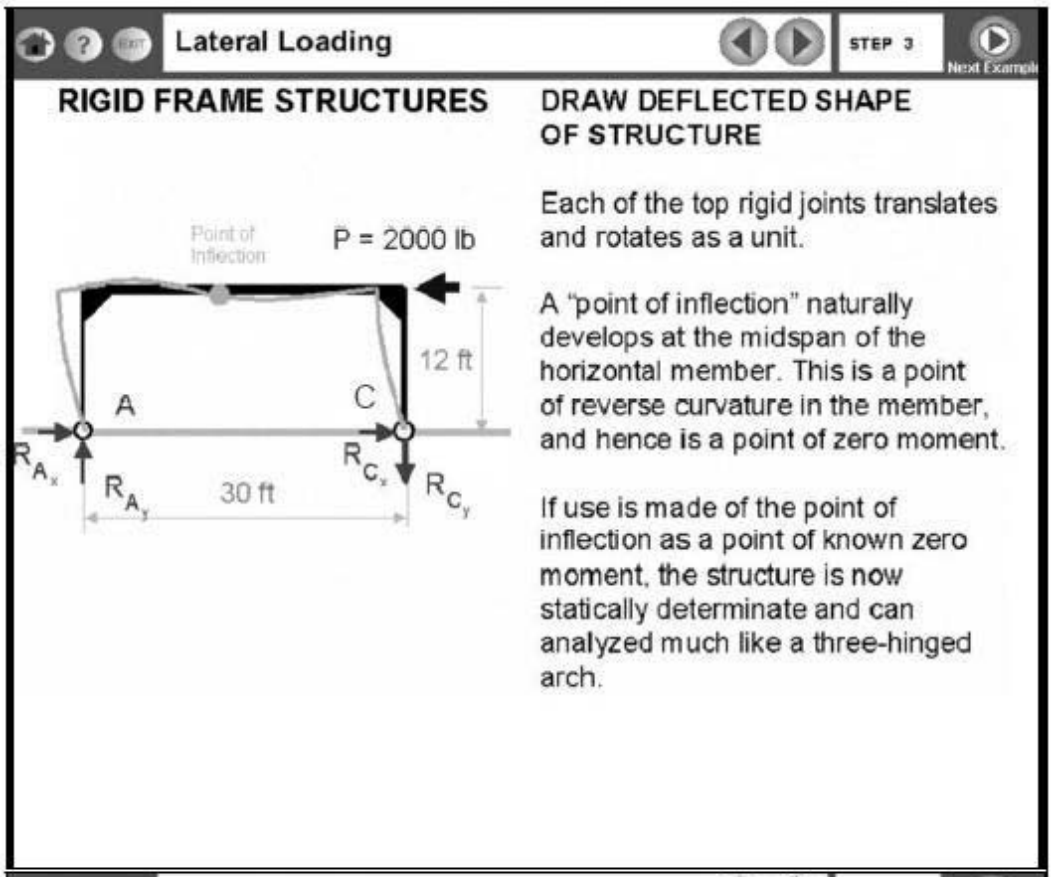
$+ R_{A_y} - 800 = 0$ or $R_{A_y} = 800 \uparrow$

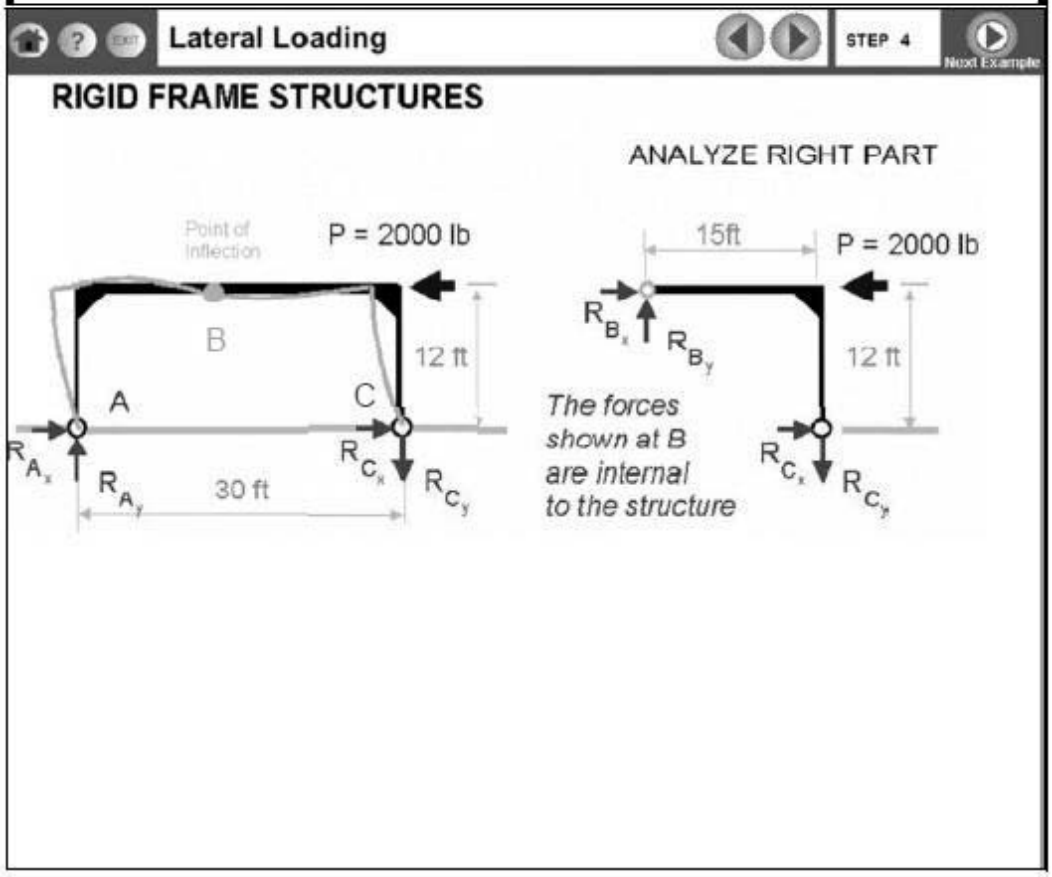
$\Sigma F_x = 0$

$R_{A_x} + R_{C_x} = 2000$

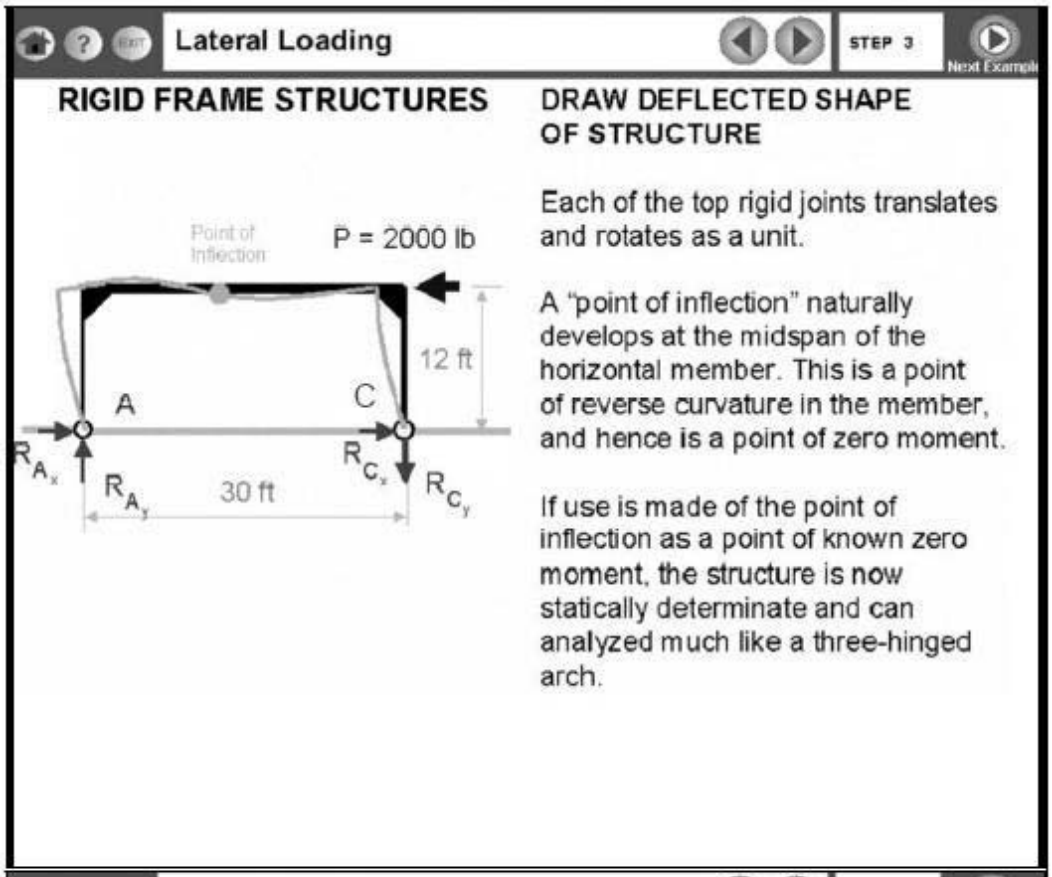
This last equation cannot be solved by statics alone. The structure is actually statically indeterminate. As shown on the following slides, an approximate method of analysis can be used to find the unknown reactions.

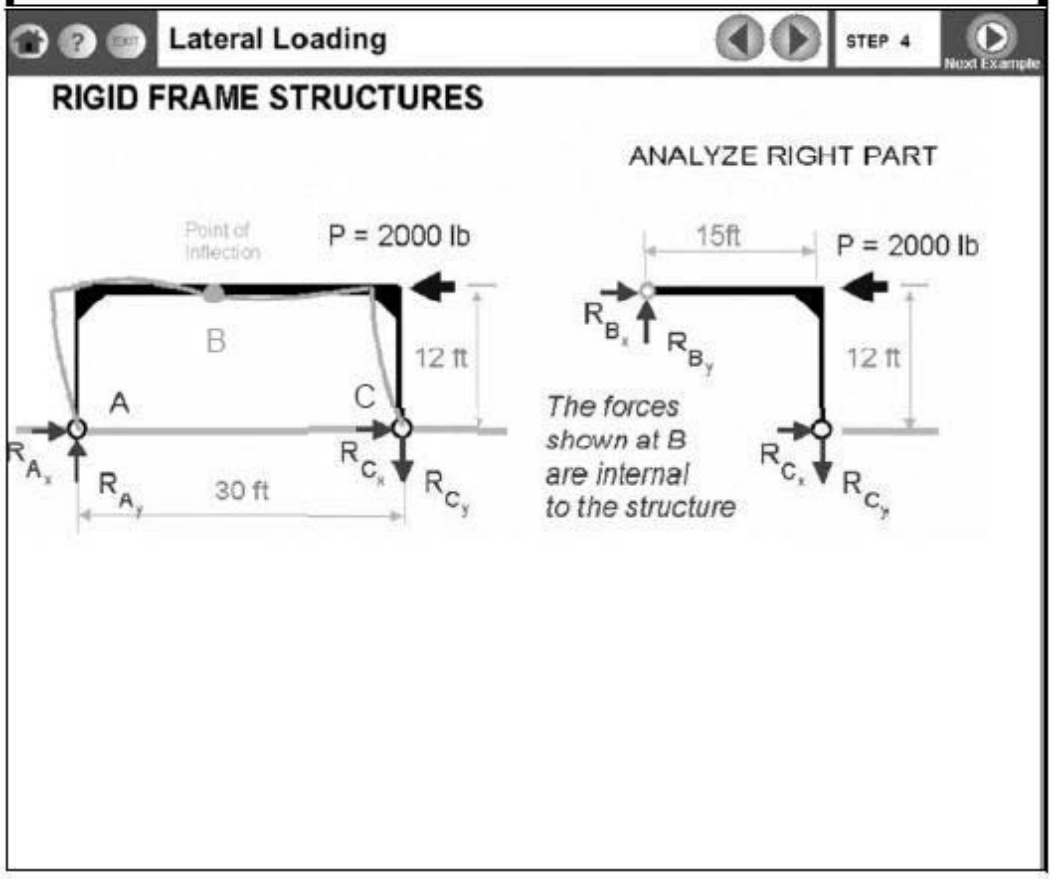
Example 1 (continued)





Example 1 (continued)





Example 1 (continued)