Name: _____

Group members: _____ _____ _____

# TAM 210/211 - Worksheet 6

Objectives:

- Obtain resultant forces and moments for equivalent systems.

- Evaluate distributed loadings intensities.
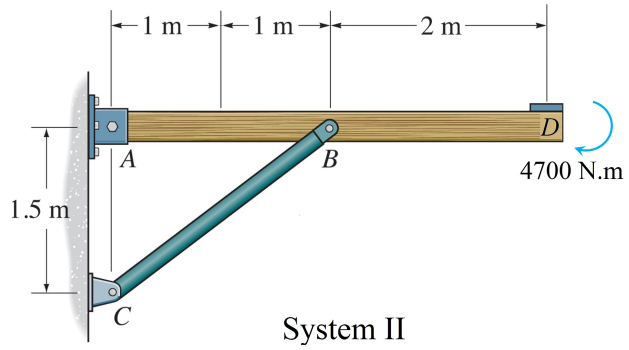
Team Building Exercise

What are your teammates' favorite animals?

Equivalent systems

1) The overhanging beam is supported by a pin at A and the strut BC. Show that the loading conditions below are equivalent by replacing the loadings by a single resultant force and a moment at A.
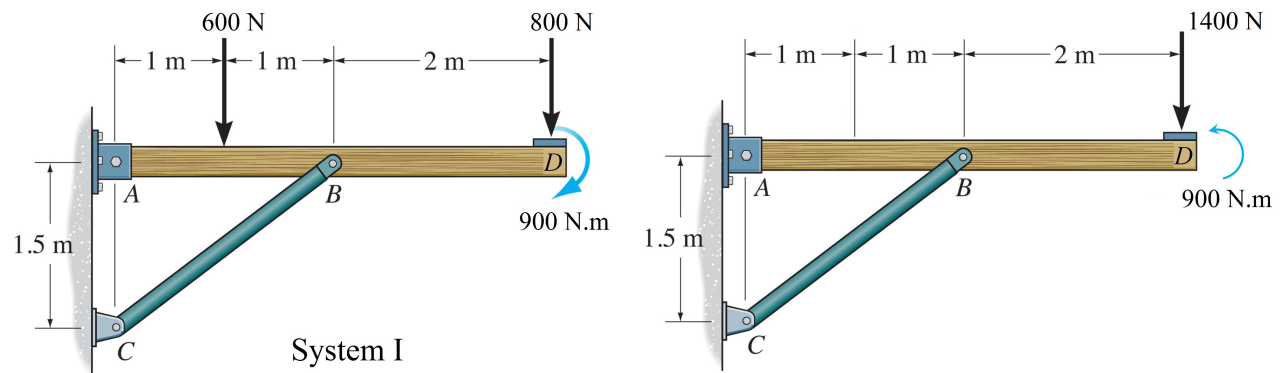
System I

2) Is the loading condition in System II equivalent to the ones above? Explain.
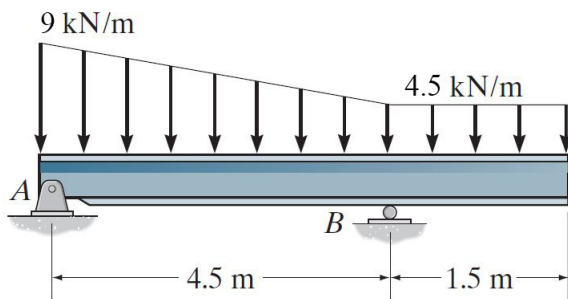

System II

3) Replace the force system acting on the left frame below by a single resultant force acting on member AB. Sketch your equivalent system on the right frame.
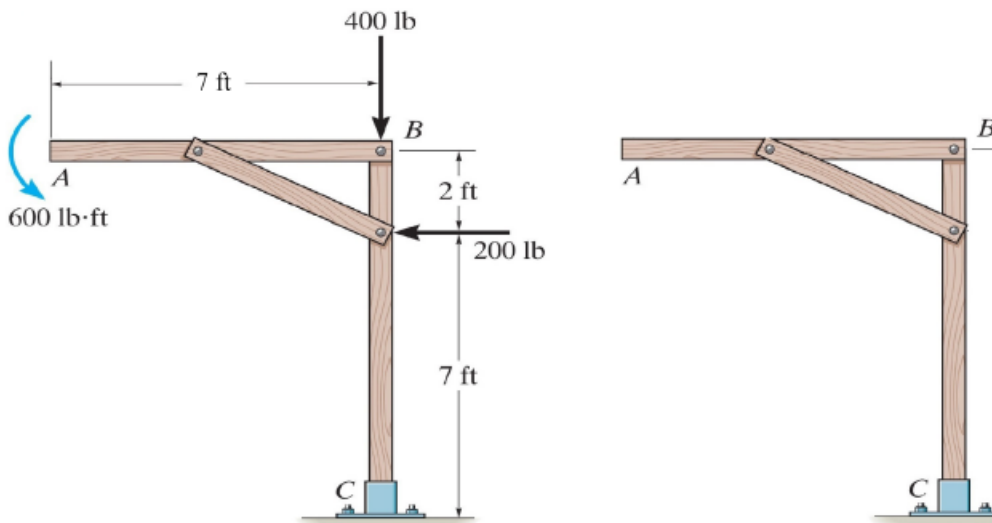
Work space for Problem 3.

Reduction of distributed loads

4) Determine the resultant force and specify where it acts on the beam measured from end A.

Group Challenge

5) Given the piping system below, design a loading system by placing <u>two</u> 10-lb forces and <u>one</u> 20-lb·in couple moment in either $\pm i$, $\pm j$, or $\pm k$ direction. Choose the locations where these forces/couple moment are applied from the following list: O, A (half way between O and B), B, C, D, E (half way between D and F) and F.

(A) Create an answer key for finding the resultant force and moment at O on the back.

(B) Trade your design with another group and try to find the equivalent resultant force and moment at O for their design. Check your answer with their answer key.

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