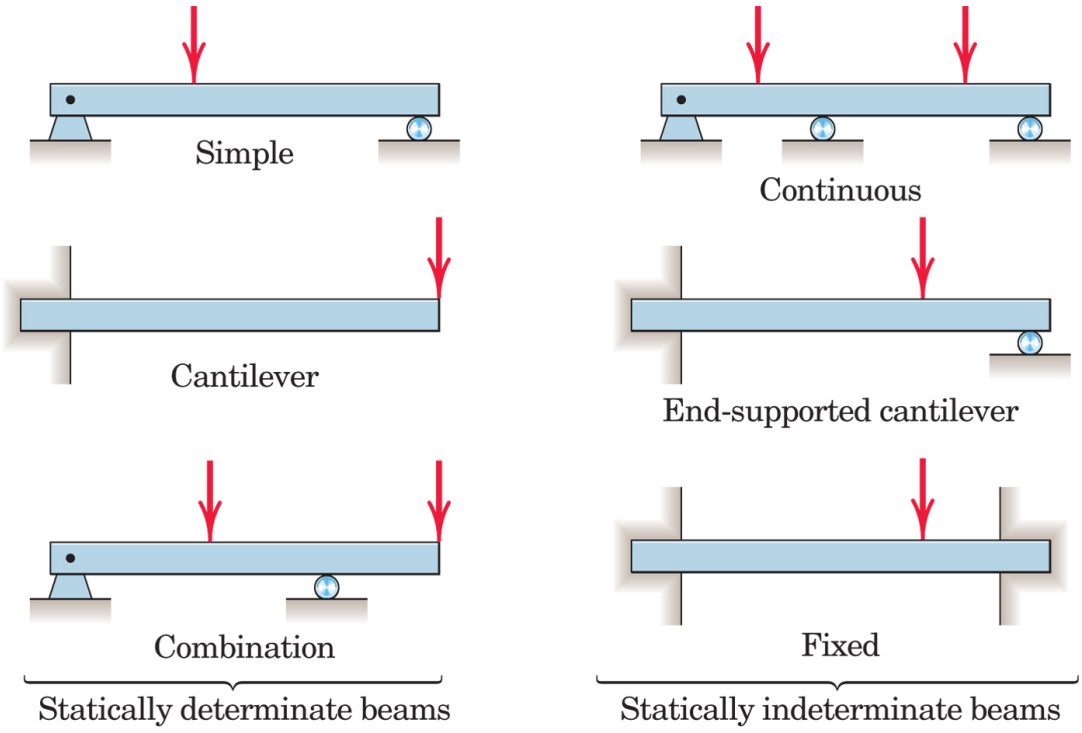
ENGG 202
March 20 Week 10

Problems

5/6 Distributed Loads

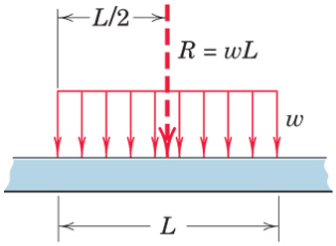
We will use *beams* as an example to demonstrate distributed loads.

Beams are structural members that offer resistance to bending due to applied loads. Most beams are long prismatic bars, and the loads are usually applied normal to the axes of the bars.

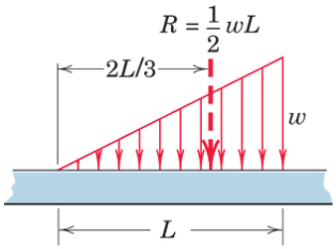


Distributed Loads

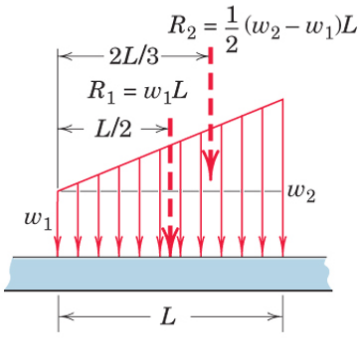
Loading intensities which are constant or which vary linearly are easily handled.



(a)



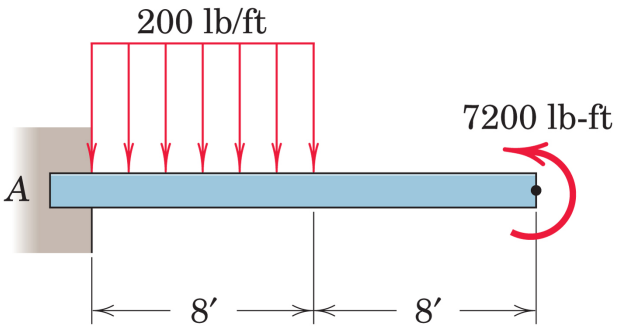
(b)



(c)

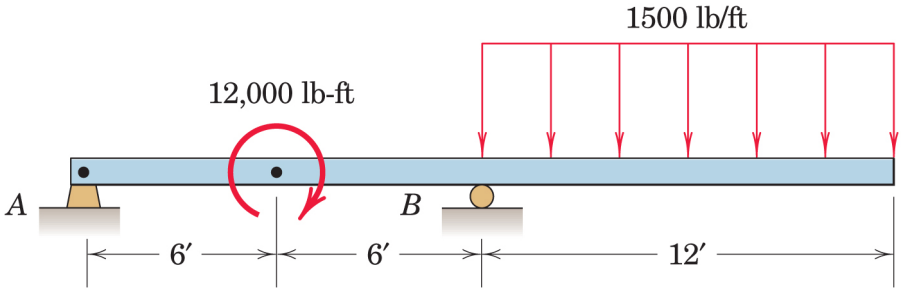
Problem 5/105

Find the reaction at A due to the uniform loading and the applied couple.



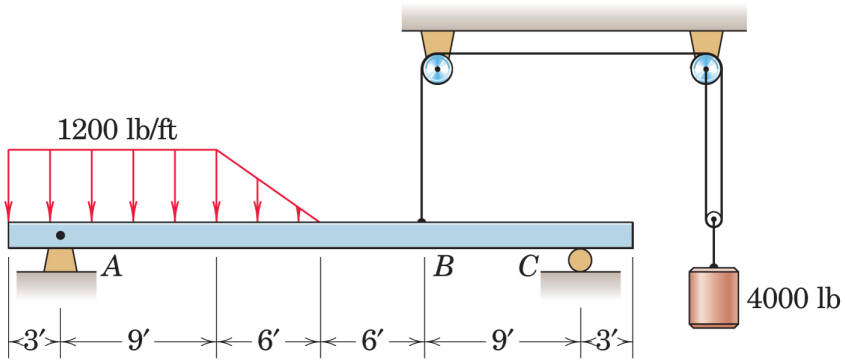
Problem 5/107

Determine the reactions at A and B for the beam loaded as shown.



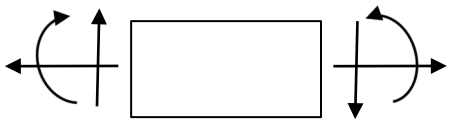
Problem 5/111

Determine the reactions at A and C for the beam subjected to the combination of point and distributed loads.



5/6 Internal effects

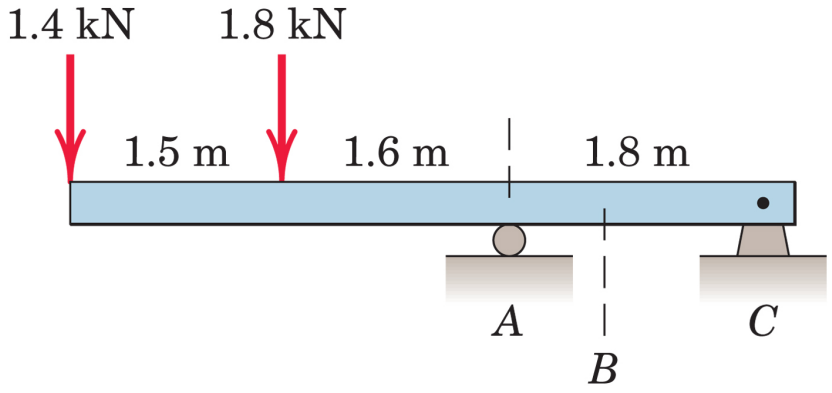
As seen previously, the peculiar property of trusses (as a particular case of frames) is that *in a truss every member is a two-force member*. Moreover, since the members of a truss are straight, *the internal forces in a truss boil down to either tension or compression* acting on the normal cross sections of each member.
In general, this is not the case for a structural member. If we consider the case of a *plane structural member,* the internal forces are:
SHEAR FORCE
NORMAL (or AXIAL) FORCE
BENDING MOMENT



We will restrict our analysis of internal forces to *beams*.

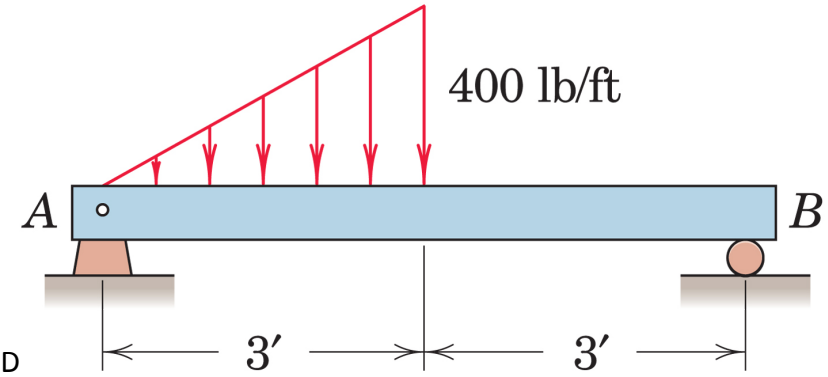
Problem 5/126

Determine the shear force V at a section B between A and C and the bending moment at A.



Problem 5/132 (modified)

Determine the shear force and the bending moment at a section 2ft from the right end of A.



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