

Distributed Loads

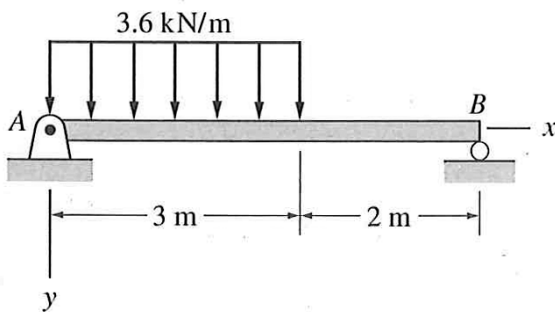
In many situations forces don't act at a single point but rather act over line, area or volume. These forces are known as distributed forces. Distributed loads can be simplified by replacing a distributed load with an equivalent concentrated load known as the *resultant*.

To find reactions for problems involving distributed loads:

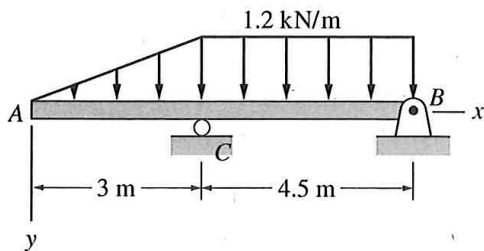
1. Replace a distributed load with an equivalent concentrated load (resultant), where:
 - The magnitude of the equivalent load is the “area” under the loading curve.
 - The line of action of the equivalent load passes through the centroid of the “area.”
2. Once simplified, use standard equilibrium techniques to solve for the reactions.

Homework

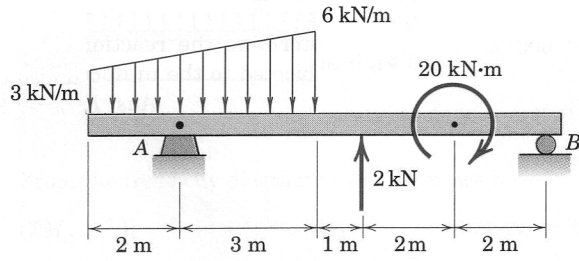
1. Find the reactions at *A* and *B*.



2. Replace the distributed loading with an equivalent resultant force and specify its location on the beam measured from *A*. Determine the reactions at *B* and *C*.



3. Find the reactions at *A* and *B*.



4. A carpenter holds a 14 foot long board. The board has a weight of 2 pounds/linear foot. In addition, bricks are piled that result in a triangular distributed load. Determine the vertical forces the carpenter must exert for equilibrium. Assume both hands exert the same forces, spaced 2 feet apart.

