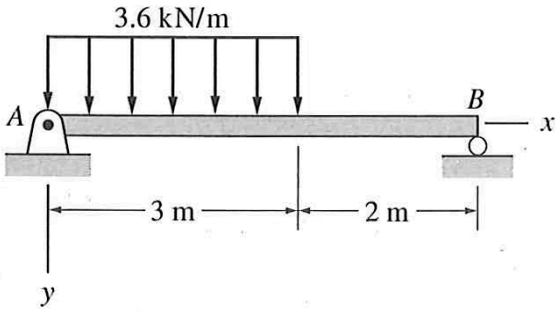
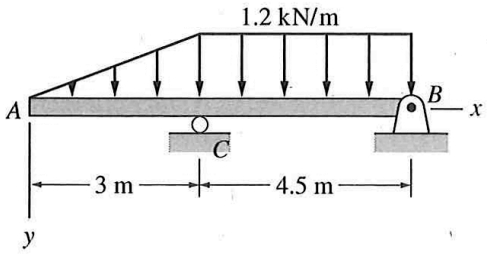
To find the internal forces at a given point:

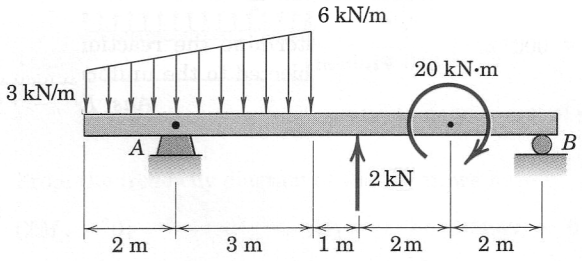
1. Find reactions if necessary.
2. Take an imaginary cut through the point of interest.
3. Draw a free body diagram of one half of the object, exposing an internal shear, normal force and bending moment. Draw the arrows according to the sign convention for shear and bending moments.
4. Solve for the three unknown internal forces using the standard approach. Negative solutions indicate that assumed values are incorrect and true values are the opposite direction.

Problems 1, 2, and 3:

Find the shear and bending moment at the midpoint of each of the beams from Lesson 33.







Problem 4

A pin connected circular arch supports a 5000 lb load as shown. Neglecting the weights of the members determine the normal force, shear force, and bending moment that act on the cross section at ①.

Comment on how the result would change if member *BC* was straight. Which is the better design?