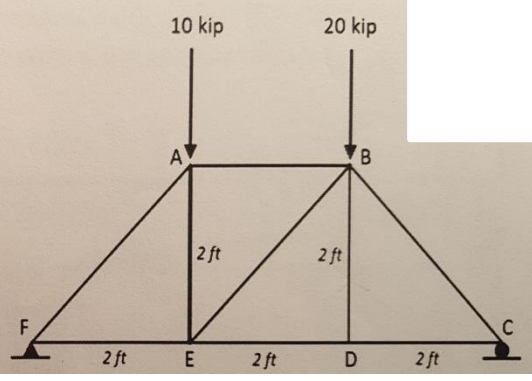


1. The truss is supported by a pin at F and a roller at C .
 - (a) Draw a free-body diagram of the truss
 - (b) Determine the support reaction at roller C
 - (c) Draw relevant free-body diagrams, and determine the force in member AB , the force in member BE , and the force in member BD . Report whether each is in tension or compression. *Solution without supporting free-body diagrams will receive zero credit.*

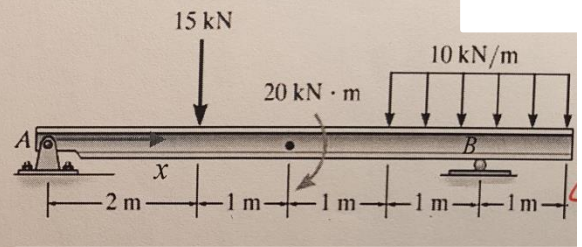


3. A simply-supported beam is loaded as shown.

(a) Draw a free-body diagram of the beam.

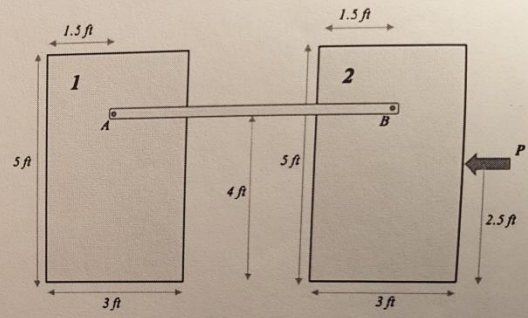
(b) Draw the shear force diagram of the beam. Label all values, and indicate whether the variation is 1st, 2nd, or 3rd-order in each region, as applicable.

(c) Draw the bending moment diagram of the beam. Label all values, and indicate whether the variation is 1st, 2nd, or 3rd-order in each region, as applicable.



Show all of your work.

4. Identical, homogeneous blocks 1 and 2 weigh 100 pounds each. They are linked with a horizontal bar pinned at A and B. Force P is applied to block 2 as shown. The coefficient of static friction between the floor and each block is 0.4
- (a) For the condition of impending motion for the system, block 1 tips. Draw the free-body diagram of block 1
 - (b) Determine the magnitude and direction of the friction force acting on block 1
 - (c) Draw the free-body diagram of block 2
 - (d) For the condition of impending motion for the system, determine whether block 2 slips or tips. Circle "slips" or "tips".
 - (e) Determine the magnitude and direction of the friction force acting on block 2
 - (f) For the condition of impending motion for the system, determine the value of P



R7-2. Determine the normal force, shear force, and moment at points *B* and *C* of the beam.

