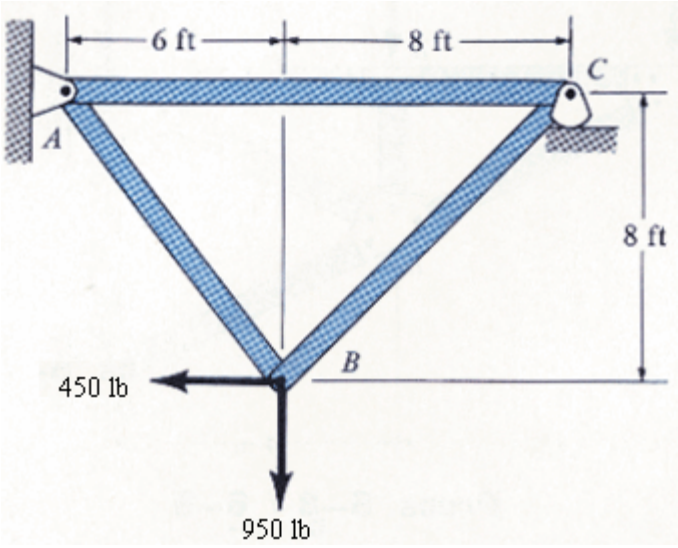
Engineering Statics
Homework 4

1.
Determine the force in each member of the truss and state if the members are in tension or compression. Enter all force values as positive numbers. Use the results of your calculation to determine if the unknown force is in tension (a positive number) or in compression (a negative number). Circle the letter representing T for tension or C for compression.

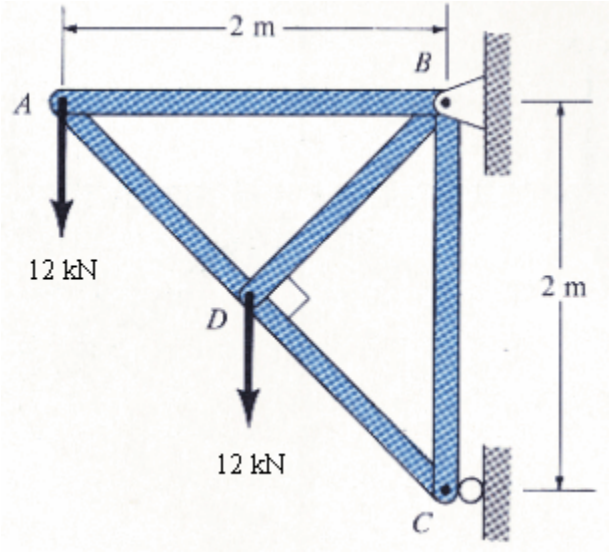


AB: _____ lb T / C

BC: _____ lb T / C

AC: _____ lb T / C

2.
Determine the force in each member of the truss and state if the members are in tension or compression. Enter all force values as positive numbers. Use the results of your calculation to determine if the unknown force is in tension (a positive number) or in compression (a negative number).



AB: _____ kN T / C

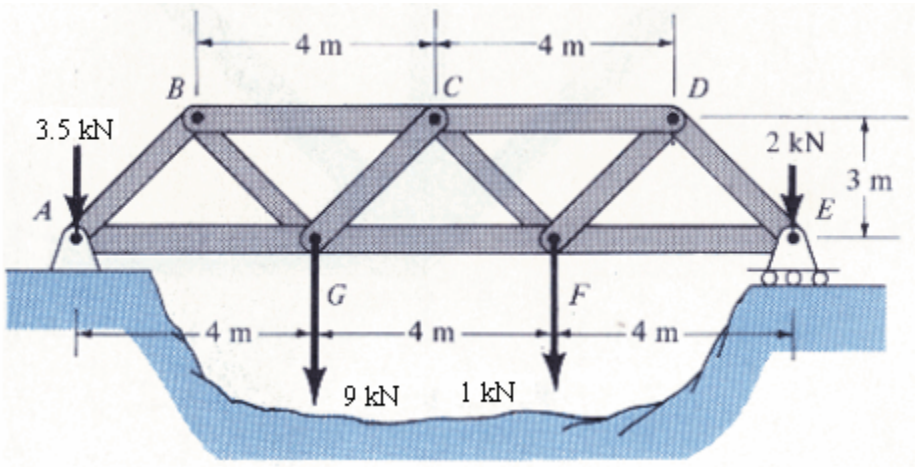
AD: _____ kN T / C

BD: _____ kN T / C

CD: _____ kN T / C

BC: _____ kN T / C

3.
The Warren bridge truss is subjected to the loadings shown. Determine the force in each member and indicate if the members are in tension or compression. Approximate each joint as a pin.
Enter all force values as positive numbers. Use the results of your calculation to determine if the unknown force is in tension (a positive number) or in compression (a negative number).



BC: _____ kN T / C

CD: _____ kN T / C

CF: _____ kN T / C

CG: _____ kN T / C

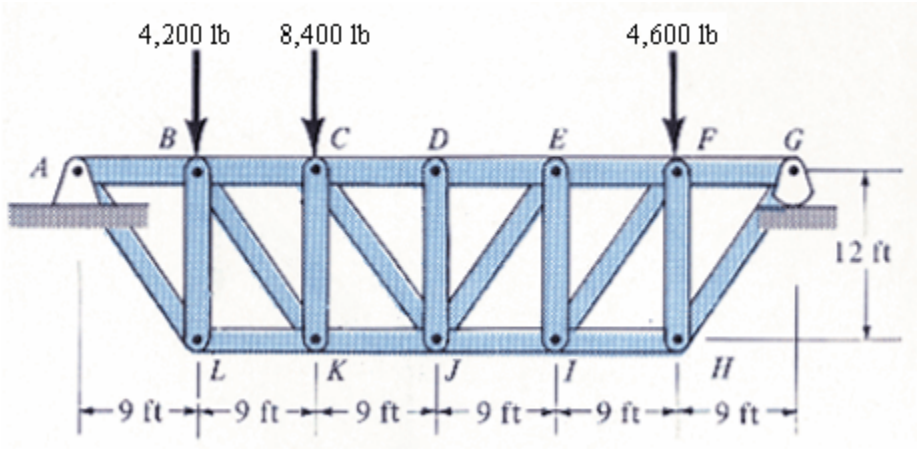
DE: _____ kN T / C

DF: _____ kN T / C

EF: _____ kN T / C

FG: _____ kN T / C

4.
Determine the force in members *CD, CJ, KJ*, and *DJ* of the truss which serves to support the deck of a bridge. State if the members are in tension or compression.



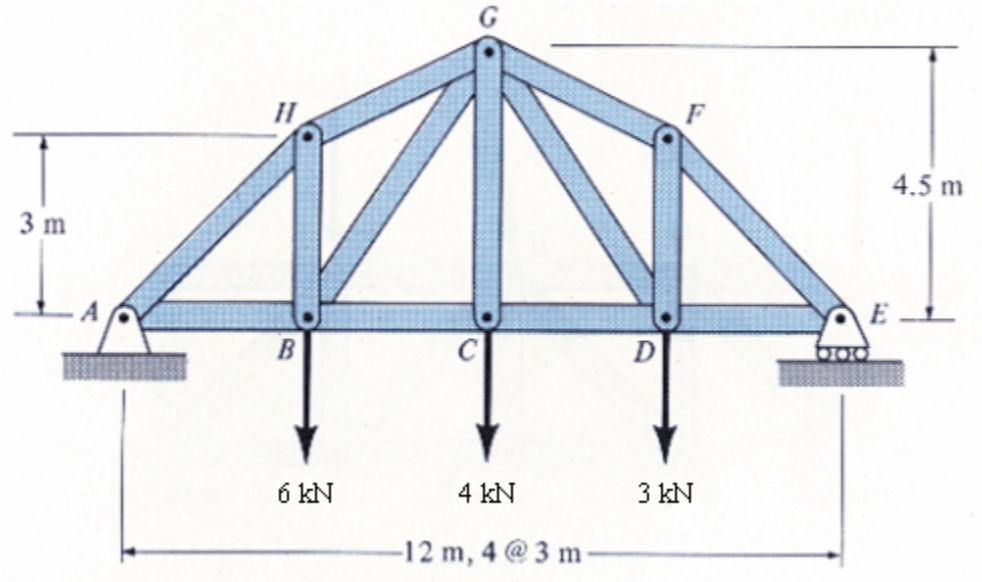
CD:_____ lb T / C

CJ:_____ lb T / C

KJ:_____ lb T / C

DJ:_____ lb T / C

5.
Compute the force in members *CD, GD*, and *GC* of the truss and indicate whether the members are in tension or compression.



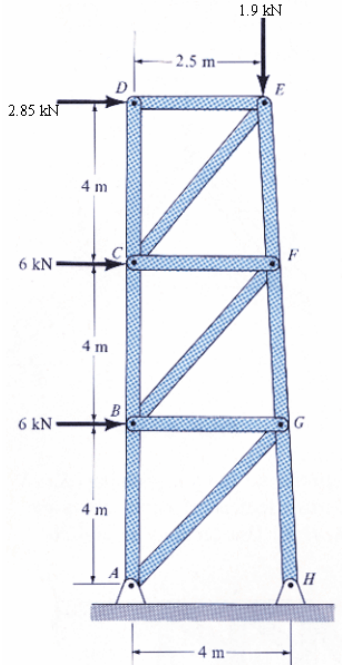
CD:_____ kN T / C

GD:_____ kN T / C

GC:_____ kN T / C

6.

The tower truss is subjected to the loads shown. Determine the force in *BC, BF,* and *FG*. Use a single equilibrium equation for the calculation of each force. Indicate if the members are in tension or compression. The left side, *ABCD*, stands vertical.

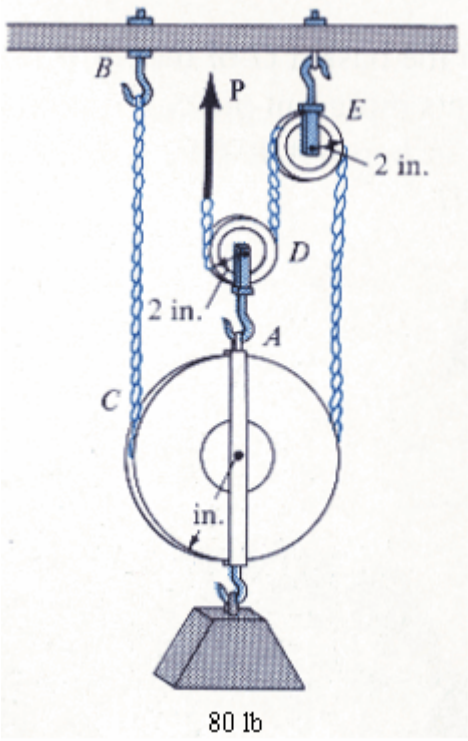


BC: _____ kN T / C

FG: _____ kN T / C

BF: _____ kN T / C

7.
Determine the force **P** needed to suspend the 80-lb weight. Also, what are the reactions at *A* and *B*?

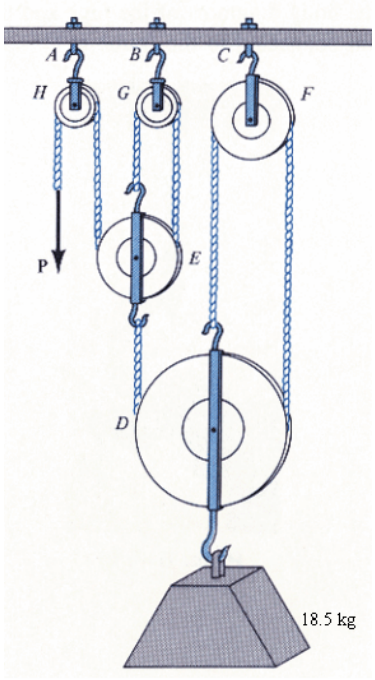


|**P**| = _____ lb

A = _____ lb

B = _____ lb

8.
Determine the force **P** needed to support the 18.5-kg mass using the Spanish Burton rig. Also, what are the reactions at the supporting hooks *A, B*, and *C*?



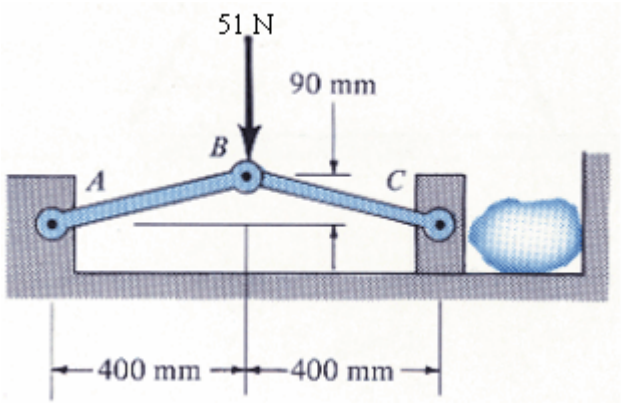
|**P**| = _____ N

A = _____ N

B = _____ N

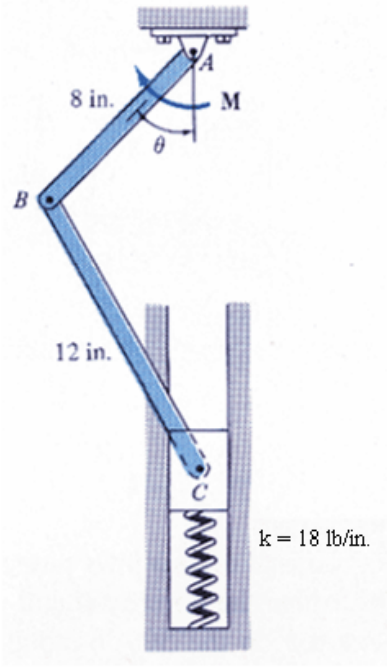
C = _____ N

9.
Determine the compressive force exerted on the specimen by a vertical load of 51 N applied to the toggle press.



F_C = _____ N

10.
The piston C moves vertically between the two smooth walls. If the spring has a stiffness of k = 18 lb/in. and is unstretched when θ=0° determine the couple **M** that must be applied to AB to hold the mechanism in equilibrium when θ=30°.



M = _____ in. lb