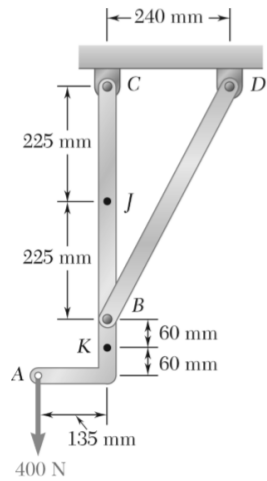## PROBLEM 7.1

Determine the internal forces (axial force, shearing force, and bending moment) at Point J of the structure indicated.

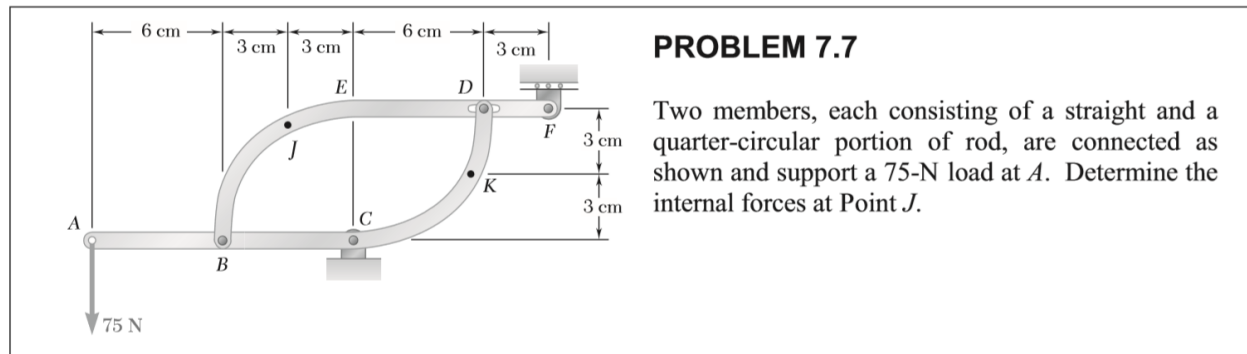Frame and loading of Problem 6.75.

Ans. $F = 720$ N $\rightarrow$, $V = 140$ N $\uparrow$, $M = 11.2$ N-m $\circlearrowright$
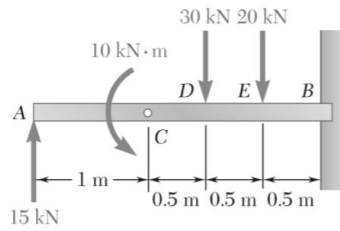
PROBLEM 7.3

Determine the internal forces at Point J of the structure shown.

Ans. $F = 625$ N $\downarrow$, $V = 120$ N$\leftarrow$, $M = 27.0$ N-m $\curvearrowright$

PROBLEM 7.7

Two members, each consisting of a straight and a quarter-circular portion of rod, are connected as shown and support a 75-N load at A. Determine the internal forces at Point J.

Ans. $F = 12.50$ N $\measuredangle$ 30°, $V = 21.7$ N $\measuredangle$ 60°, $M = 0.75$ N-m

PROBLEM 7.35

For the beam and loading shown, (*a*) draw the shear and bending-moment diagrams, (*b*) determine the maximum absolute values of the shear and bending moment.

Ans. (*a*) Reaction force at support: M_B = -12.5 kN-m (*b*) $|V|_{max}$ = 35.0 kN, $|M|_{max}$ = 12.50 kN-m
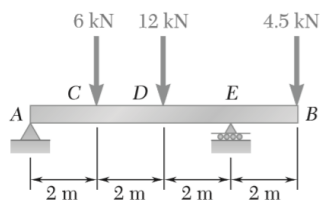
PROBLEM 7.37

For the beam and loading shown, (a) draw the shear and bending-moment diagrams, (b) determine the maximum absolute values of the shear and bending moment.
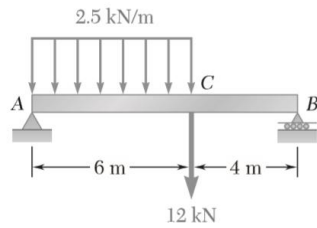
Ans. (a) Reaction force at support: $F_E = 16$ kN, $F_A = 6.50$ kN, (b) $|V|_{max} = 11.50$ kN, $|M|_{max} = 14.00$ kN-m

2.5 kN/m

A

C

B

6 m

4 m

12 kN

PROBLEM 7.42

For the beam and loading shown, (a) draw the shear and bending-moment diagrams, (b) determine the maximum absolute values of the shear and bending moment.
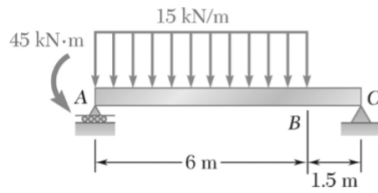
Ans. (a) Reaction force at support: $F_B = 11.70$ kN, $F_A = 15.30$ kN, (b) $|V|_{max} = 15.30$ kN, $|M|_{max} = 46.80$ kN-m

15 kN/m

45 kN·m

A

B

C

6 m

1.5 m

PROBLEM 7.77

For the beam and loading shown, (a) draw the shear and bending-moment diagrams, (b) determine the magnitude and location of the maximum absolute value of the bending moment.

Ans. (a) Reaction force at support: $F_C = 30$ kN, $F_A = 60$ kN, (b) 75.0 kN-m, 4.00 m from A