## PROBLEM 4.1

20　40　20

20

**M = 15 kN · m**

*A*

80

20

*B*
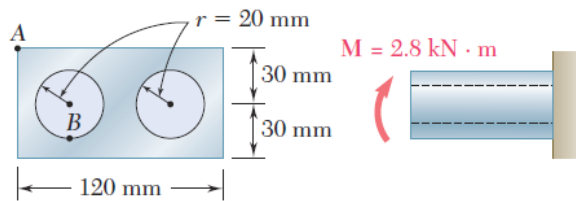
Dimensions in mm

Knowing that the couple shown acts in a vertical plane, determine the stress at (*a*) point *A*, (*b*) point *B*.

## PROBLEM 4.6

*A*

*r* = 20 mm

30 mm

**M = 2.8 kN · m**

*B*

30 mm

120 mm
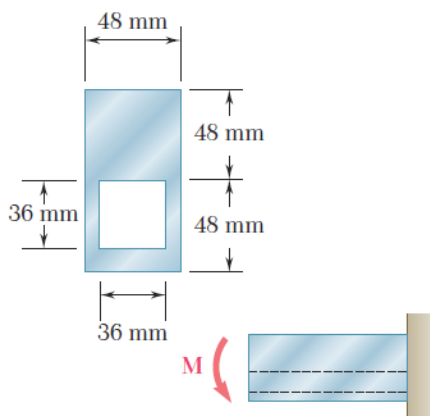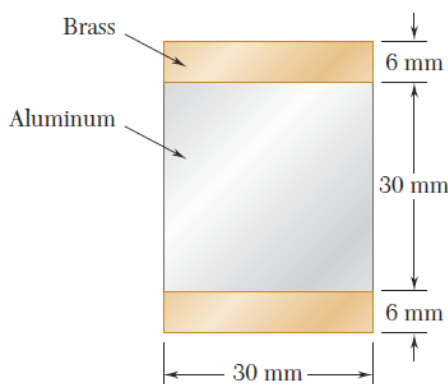
Knowing that the couple shown acts in a vertical plane, determine the stress at (*a*) point *A*, (*b*) point *B*.

## PROBLEM 4.20

48 mm

48 mm

36 mm

48 mm

36 mm

**M**

Knowing that for the extruded beam shown the allowable stress is 120 MPa in tension and 150 MPa in compression, determine the largest couple **M** that can be applied.

## PROBLEM 4.33

Brass

6 mm

Aluminum

30 mm

6 mm

30 mm

A bar having the cross section shown has been formed by securely bonding brass and aluminum stock. Using the data given below, determine the largest permissible bending moment when the composite bar is bent about a horizontal axis.

|  | Aluminum | Brass |
|---|---|---|
| Modulus of elasticity | 70 GPa | 105 GPa |
| Allowable stress | 100 MPa | 160 MPa |

## PROBLEM 4.38



10 in.

3 in.    3 in.

$\frac{1}{2}$ in.
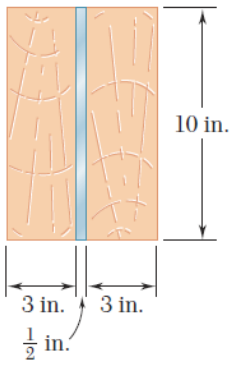
Wooden beams and steel plates are securely bolted together to form the composite member shown. Using the data given below, determine the largest permissible bending moment when the member is bent about a horizontal axis.

|  | Wood | Steel |
|---|---|---|
| Modulus of elasticity: | $2\times10^6$ psi | $29\times10^6$ psi |
| Allowable stress: | 2000 psi | 22 ksi |