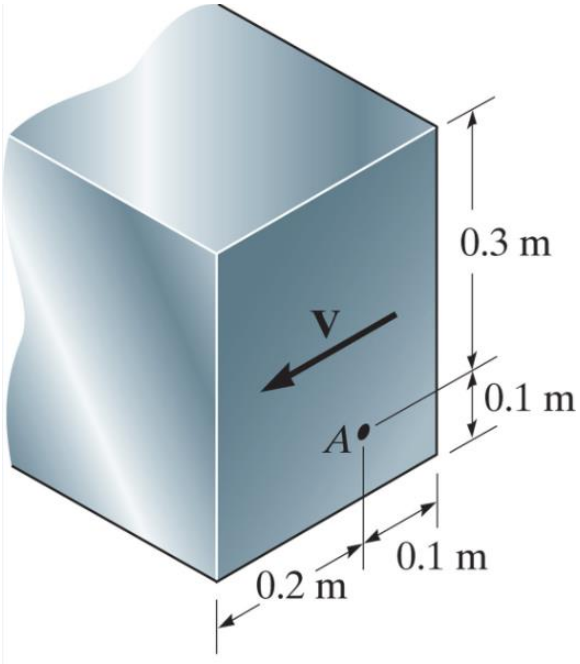
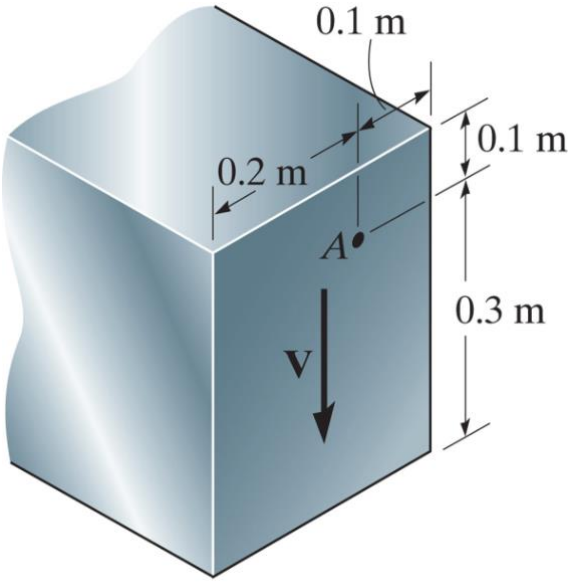
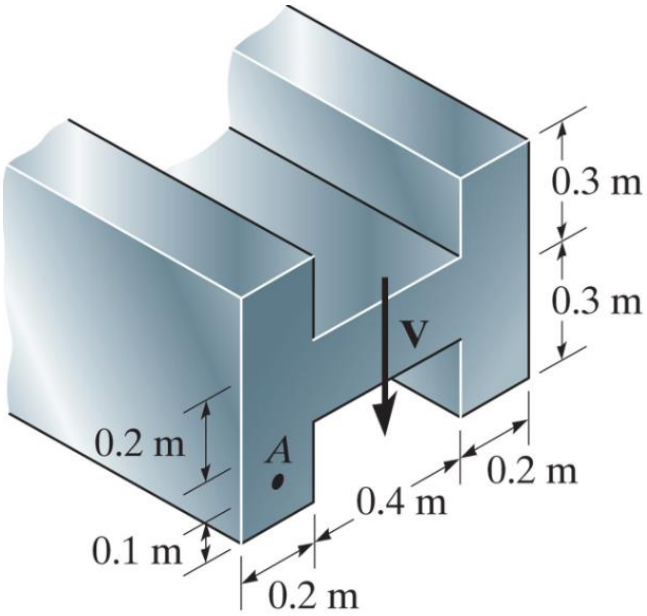
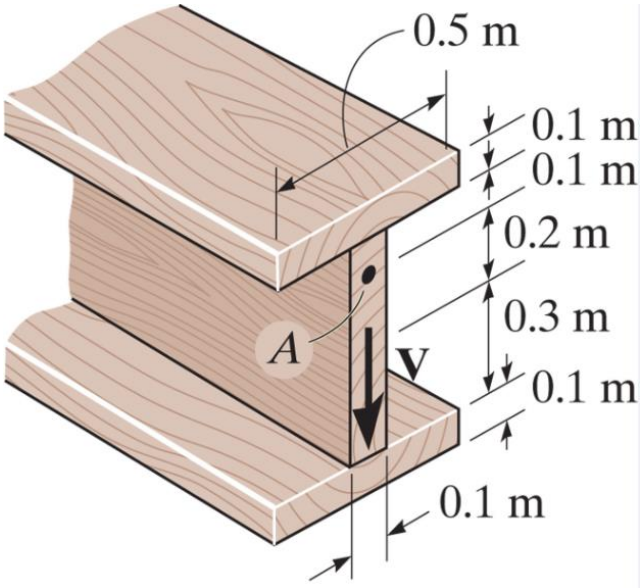
Solving for I, Q, and t

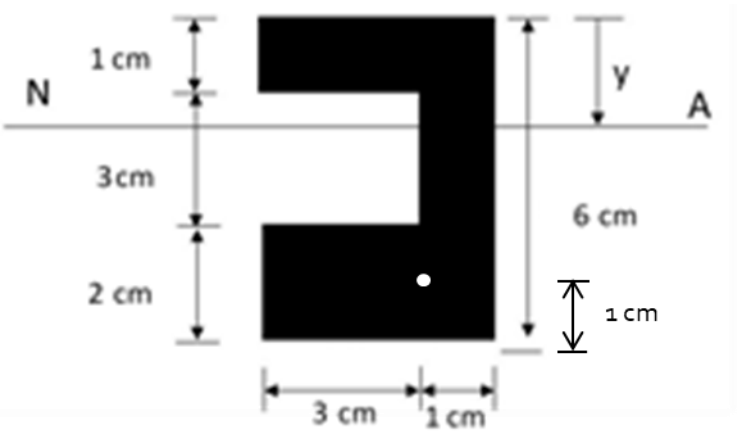
Calculate the value of I, Q and t that are used in the shear formula for finding the shear stress at point A.

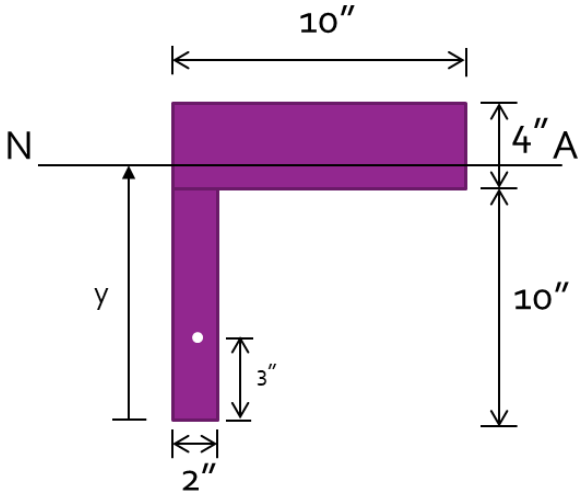





0.3 m
0.3 m
V
0.2 m
A
0.2 m
0.4 m
0.1 m
0.2 m

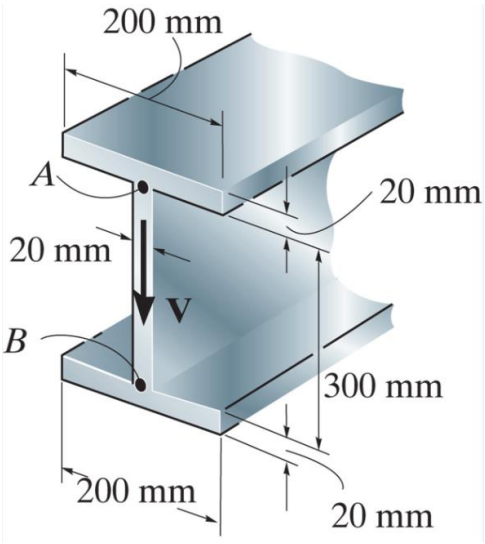

0.5 m
0.1 m
0.1 m
0.2 m
0.3 m
A
V
0.1 m
0.1 m


1 cm
N
y
A
3cm
6 cm
2 cm
1 cm
3 cm
1 cm


10″
N
4″
A
y
10″
3″
2″

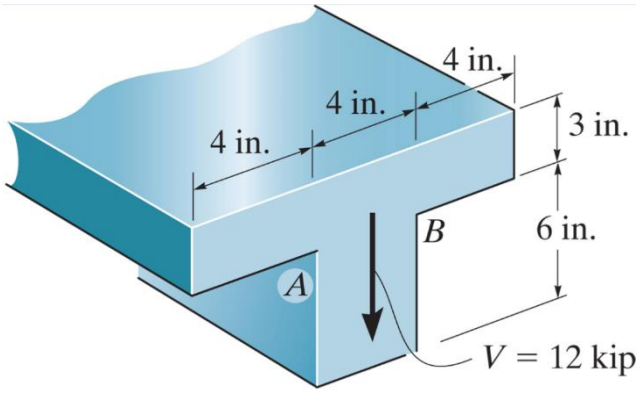
Example 1

If the wide-flange beam is subjected to a shear of V=20 kN, determine the shear stress on the web at A. Indicate the shear-stress components on a volume element located at this point.



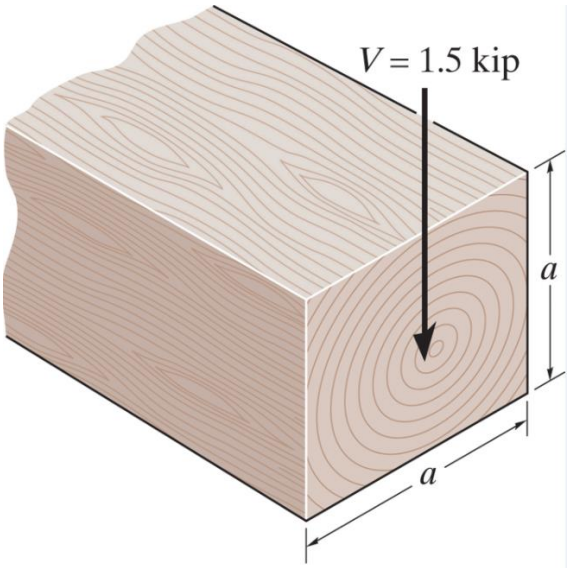
Example 2

If the T-beam is subjected to a vertical shear of V = 12 kip, determine the maximum shear stress in the beam. Also, compute the shear-stress jump at the flange-web junction AB. Sketch the variation of the shear-stress intensity over the entire cross section.



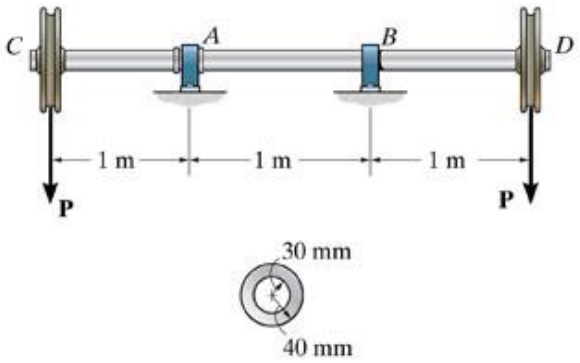
Example 3

The beam has a square cross-section and is made of wood having an allowable shear stress of 1.4 ksi. If it is subjected to a shear force of 1.5 kip, determine the smallest dimension a of its sides.



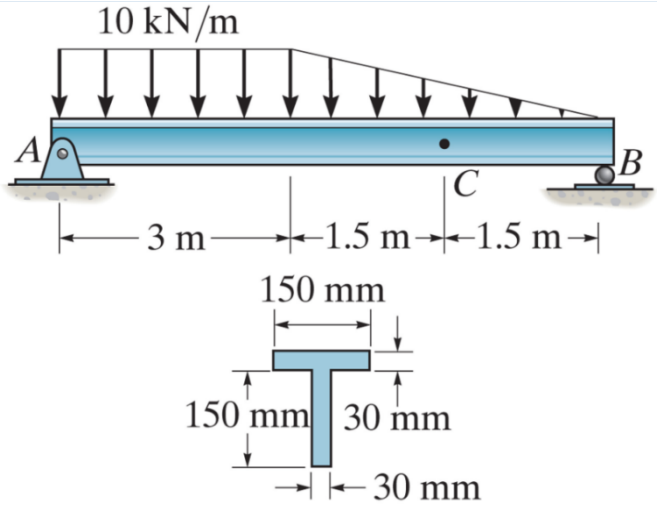
Example 4

The shaft is supported by a smooth thrust bearing at A and a smooth journal bearing at B. If P=26 kN, determine the absolute maximum shear and normal stress in the shaft.



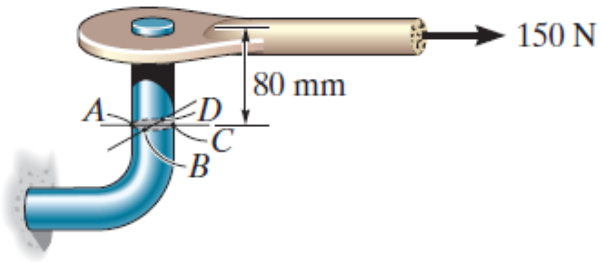
Example 5

Determine the maximum shear stress and normal stress in the T-beam at the critical section where the internal shear force is maximum and the internal bending moment is maximum.



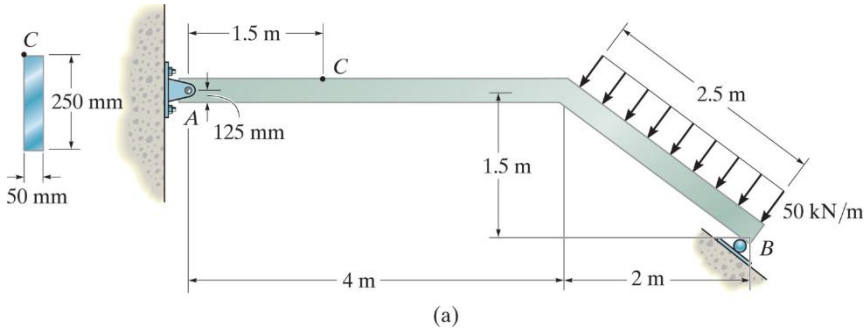
Kahoot Example

The pin support is made from a steel rod and has a diameter of 20 mm. Determine the stress at points A and B.



Example 6

The member shown has a rectangular cross section. Determine the state of stress that the loading produces at C and D.



(a)