14.42, 14.46 and the problem below.

1. A typical cross section of an idealized ship is shown in Figure 1. If the ship is subjected to a torque of $4 \times 10^6 N \cdot m$ about the longitudinal axis, compute

(a) the shear stress distribution on the cross section.
(b) the magnitude and location of maximum shear stress.

Here, the shear modulus is $G = 1.2 \times 10^{11} Pa$.

[Diagram of a cross section of a ship with labeled dimensions]

$B = 25m$  
$B_0 = 15m$  
$B_1 = 3m$  
$D = 15m$  
$H = 10m$  
$t_1 = 20mm$  
$t_2 = 16mm$

The thickness is $t_1$ unless mentioned.

Figure 1: A diagram for problem 1