

King Fahd University of Petroleum & Minerals
 DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING
CE 203 STRUCTURAL MECHANICS I (Section 2)
 Second Semester 1435 / 2014 (132)

Name: _____
 ID #: _____

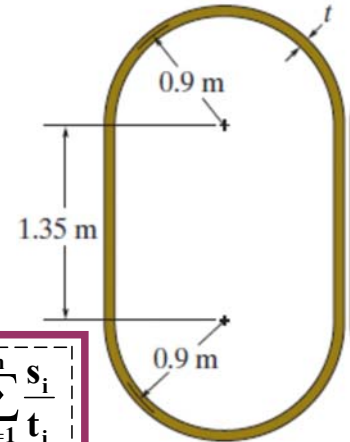
Quiz # 7

Score $\frac{\quad}{10}$

Rewrite the solution of the problem below from the HW that you just did (without looking at your solution).

5-114. The mean dimensions of the cross section of an airplane fuselage are shown. If the fuselage is made from 2014-T6 aluminum alloy having an allowable shear stress of $\tau_{\text{allow}} = 125 \text{ MPa}$ and the angle of twist per foot length of fuselage is not allowed to exceed 0.00333 rad/m , determine the maximum allowable torque that can be sustained by the fuselage. The thickness of the wall is $t = 6 \text{ mm}$.

$G = 27 \text{ GPa}$



$$\tau = \frac{T r}{J}$$

$$q = \frac{T}{2 A_m}$$

$$\tau = \frac{q}{t} = \frac{T}{2t A_m}$$

$$\phi = \frac{T L}{4 A_m^2 G} \sum_{i=1}^n \frac{s_i}{t_i}$$