

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 # 3

Score _____
10

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

***4-68.** A steel surveyor's tape is to be used to measure the length of a line. The tape has a rectangular cross section of 1.25 mm by 5 mm and a length of 30 m when $T_1 = 20^\circ\text{C}$ and the tension or pull on the tape is 100 N. Determine the true length of the line if the tape shows the reading to be 139 m when used with a pull of 175 N at $T_2 = 40^\circ\text{C}$. The ground on which it is placed is flat. $\alpha_{\text{st}} = 17(10^{-6})/^\circ\text{C}$, $E_{\text{st}} = 200 \text{ GPa}$.



$$\delta = \frac{PL}{AE}$$

$$\delta_T = \alpha \Delta T L$$