



QUIZ 3

6 February 2015
Doç. Dr. M. Ali Güler

Ad, Soyad: _____
No: _____

Problem: The center rod CD of the assembly is heated from $T_1 = 30^\circ\text{C}$ to $T_2 = 180^\circ\text{C}$ using electrical resistance heating. At the lower temperature T_1 the gap between C and the rigid bar is 0.5 mm . Determine the force in rods AB and EF caused by the increase in temperature. Rods AB and EF are made of steel, and each has a cross-sectional area of 125 mm^2 . CD is made of aluminum and has a cross-sectional area of and 375 mm^2 .

Given: $E_{\text{st}} = 200\text{ GPa}$, $E_{\text{al}} = 70\text{ GPa}$,
 $\alpha_{\text{st}} = 12(10^{-6})/^\circ\text{C}$, $\alpha_{\text{al}} = 23(10^{-6})/^\circ\text{C}$

