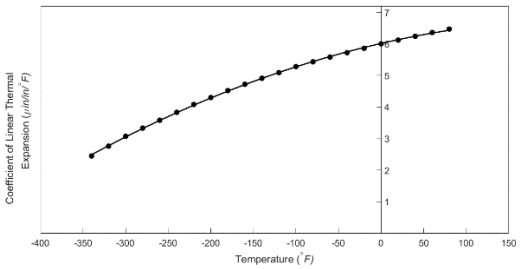
EML3041 Computational Methods: Week One: Session 1

1. A cylinder of diameter 12.363" and length 36" is cooled from 80°F to −108°F. The following information is given. Write your solution clearly and show each part separately.

$$\Delta D = D \int_{T_a}^{T_c} \alpha\,(T) dT$$

$$T_a = 80°\text{F}$$
$$T_c = -108°\text{F}$$
$$D = 12.363"$$



T(°F)	α (μin/in/°F)
-340	2.45
-300	3.07
-220	4.08
-160	4.72
-80	5.43
0	6.00
40	6.24
80	6.47

a) Estimate of the contraction of the trunnion diameter by using $\Delta D = D\,\alpha\,\Delta T$.
b) What value of linear coefficient of thermal expansion did you use in part (a) and why?
c) Use a technique for a more accurate estimation of the contraction than part (a).

Last Name _____ First Name _____ Last Name Initial