Reminders 1-14-08:

-ADDS AFTER CLASS OR IN LAB

-Read Syllabus

-Log onto Mastering Physics ASAP, MPCALABRESE0003!!!

-Log onto Computers

s

-Lab software can be obtained from desktop of computers in lab.

-Check course web page once a week.

-Sign prerequisite certificate form (Phy 4A, Math 31; 1st exam will DEFINITELY have several problems involving Math 31 topics)

-Visit and Physics Tutoring Center S-105

-Log in when entering Physics Tutoring Center

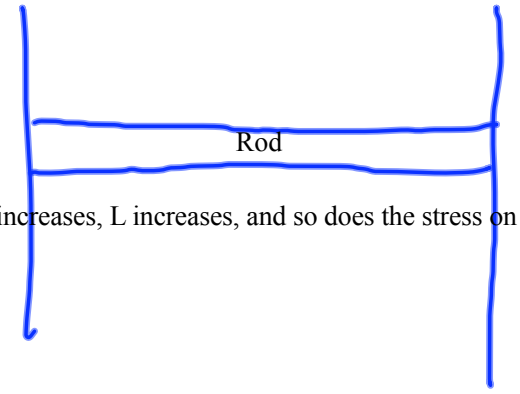
-Log in when entering lab S-107

-Read Chapter 17

-Sign up for Physics 4Z. Homework and problem solving will be discussed in this class.

Dr. Calabrese

We can state that temperature is represents the thermal state of a body and is referenced with respect to its ability to transfer heat.



As T increases, L increases, and so does the stress on the rod.

At 20 °C, an aluminum ring has an inner diameter of 5.0000 cm and a brass rod has a diameter of 5.0500 cm. If both are heated together, what temperature must they both reach to allow the ring to just slip over the rod? $\alpha_{Al} = 24 \times 10^{-6}\ °C^{-1}$, $\alpha_{Br} = 19 \times 10^{-6}\ °C^{-1}$.

$$\Delta r = \alpha r_0 \Delta T = r - r_0$$

$$r = r_0 + \alpha r_0 \Delta T$$

$$r_{Al} = r_{0Al} + \alpha_{Al} r_{0Al} \Delta T$$

$$r_{Br} = r_{0Br} + \alpha_{Br} r_{0Br} \Delta T$$

$$r_{0Al} + \alpha_{Al} r_{0Al} \Delta T = r_{0Br} + \alpha_{Br} r_{0Br} \Delta T$$

$$r_{0Al} - r_{0Br} = \alpha_{Br} r_{0Br} \Delta T - \alpha_{Al} r_{0Al} \Delta T$$

$$r_{0Al} - r_{0Br} = \Delta T \left[\alpha_{Br} r_{0Br} - \alpha_{Al} r_{0Al}\right]$$

$$\Delta T = \frac{r_{0Al} - r_{0Br}}{\left[\alpha_{Br} r_{0Br} - \alpha_{Al} r_{0Al}\right]}$$

$$\Delta T = \frac{-0.05\ cm/2}{(19\times10^{-6})\left(\frac{5.05}{2}\right) - (24\times10^{-6})\left(\frac{5.00}{2}\right)}$$

$$= 2079°C \quad \text{Not possible!}$$

$\beta = 3\alpha =$ Coefficient of Volume expansion

$\Delta V = \beta V_0 \Delta T$

$\frac{1}{K}$ or $\frac{1}{C^\circ}$ Units for coefficient of expansion.

- Suppose we have 1g of ice at -50°C, and we want to convert it to steam at 150°C, how much energy is required to do this?

$$Q = m_{ice} c_{ice} (50^{\circ}C) + m_{ice} L_f + m_w c_w (100^{\circ}C) + m_w L_v + m_{steam} c_{steam} (50^{\circ}C)$$

- A 40 g block is cooled to -78°C. It is added to 560g of water in an 80 g Cu calorimeter at a temperature of 25°C. Determine the final temperature of the system. Does all the ice melt? If not how much is left over? What if the mass of the ice was 125g?