

* Key points:-

* Time lost/gained by a pendulum clock per day

$$\Rightarrow \frac{L \Delta T}{2} \times 86400 \text{ sec.}$$

* While dealing with questions on thermal expansion; try differentiation and replace derivative with change.

e.g. $[I \text{ of rod}]_{\text{about its}} = \frac{1}{12} ML^2$
 director

differentiate w.r.t. L

$$\Rightarrow \frac{dI}{dL} = \left(\frac{1}{12}\right)(M)(2L)$$

$$\Rightarrow dI = \left(\frac{ML}{6}\right) dL$$

$$\Rightarrow \Delta I = \left(\frac{ML}{6}\right) \Delta L$$

Then apply; $\Delta L = L \alpha \Delta T$ or $\Delta A = A \beta \Delta T$ or $\Delta V = V \gamma \Delta T$
as the case may be.

* $\Delta L \rightarrow$ expansion (if ΔT is positive)

$\Delta L \rightarrow$ contraction (if ΔT is negative)