Condition:

A square plate of side 10 cm is made of a metal of linear expansivity 210−5/K. As the plate is heated from 30oC to 100o, the area of one face of the plate will increase to ----------

Solution:

Let $10\ cm = l; 30° = t_1; 100° = t_2; 2 * 10^{-5} K^{-1} = \alpha$.

We need to find S.

We used the formula:$S = l_T^2$.

$l_T = l\big(1 + \alpha(t_2 - t_1)\big)$, so $S = \Big(l\big(1 + \alpha(t_2 - t_1)\big)\Big)^2 \rightarrow S = \Big(10\big(1 + 2 * 10^{-5}(100 - 30)\big)\Big)^2$.

$S = 100.28\ cm^2$.

Answer: $S = 100.28\ cm^2$.