Answer on question #65460, Physics / Other

Question An iron cube has each edge 15cm long at 20 degree Celsius what will be the new surface area when the temperature rises at 80drgree Celsius and find the volume at the same final temperature.

Solution Linear coefficient of thermal expation of iron is $\alpha = 12 \cdot 10^{-6}$ K^{-1}. Area will change as 2α. Hence,

$$S = S_0 \cdot (1 + 2\alpha\Delta T) = 6 \cdot 15^2 \cdot (1 + 2 \cdot 12 \cdot (80 - 20) \cdot 10^{-6}) = 1351.296\, cm^2$$

Volume will change as 3α. Hence,

$$V = V_0 \cdot (1 + 3\alpha\Delta T) = 15^3 \cdot (1 + 3 \cdot 12 \cdot (80 - 20) \cdot 10^{-6}) = 3379.86\, cm^3$$