13. A rectangular plate with insulate surface is wide and so long compared to its width that may be considered infinite in the length without introducing an appreciable error. If the temperature along one short edge y = 0 is given by $u(x,0) = 100 \sin \frac{\pi x}{8}$ in $0 < x < 8$ while the two long edges x = 0, x = 8 as well as the other short edges are kept at $0^{\circ}C$. find the steady state temperature function u(x,y).
14. An infinitely long plane uniform plate is bounded by two parallel edges x=0 and x=I and an end at right angles to them. The breadth of this edges y=0 is l and is maintained at a temperature $f(x) = k(lx - x^2)$. All the other three edges are at $0^{\circ}C$. Find the steady state temperature at any interior point of the plate.
15. .A rectangular plate with insulated surface is 10cm wide and so long compared to its width that it may be considered infinite in length without introducing appreciable error. The temperature at short edges x = 0 is given by $u = \begin{cases} 20y & 0 \le y \le 5 \\ 20(10 - y) & 5 \le y \le 10 \end{cases}$ and all the other three edges are kept at $0^{\circ}C$. Find the steady state temperature at any point in the plate.

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