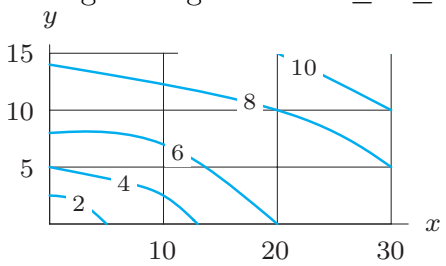
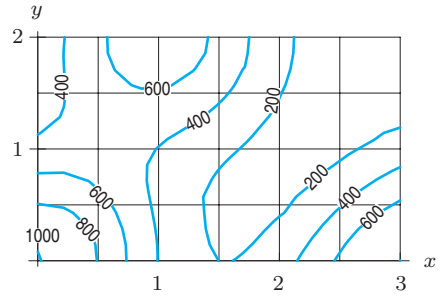
Problem 1: The contour diagram of a function f is shown below. Estimate $\int_R f\ dA$ if R is the rectangular region with $0 \le x \le 30$ and $0 \le y \le 15$.



Problem 2: The table below gives the values of $f(x, y)$, the number of milligrams of mosquito larvae per square meter in a swamp. If x and y are in meters and R is the rectangle with $0 \le x \le 8$ and $0 \le y \le 6$, estimate $\int_R f\ dA$. Give units and interpret your answer.

y \ x	0	4	8
0	1	3	6
3	2	5	9
6	4	9	15

Problem 3: The figure below shows a contour plot of population density, people per square kilometer, in a rectangle of land 3 km by 2 km. Estimate the population in this region.



Problem 4: If R is the rectangle $[0, 2] \times [0, 4]$, then evaluate

$$\int_R 2x \; dA.$$