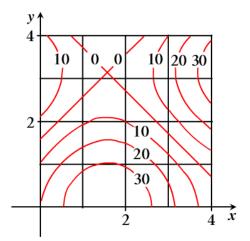
1) Estimate the volume of the solid that lies below the surface z = xy and above the rectangle

 $R = \{(x, y) | 0 \le x \le 6, 0 \le y \le 4\}$  use a Riemann sum with m = 3, m = 2, and take the sample point to be the upper right corner of each square.

2) Use the Midpoint Rule to estimate the volume of the solid in problem 1.

3) Use Riemann sum with m = n = 2 to estimate the value of  $\iint_R \sin(x+y) dA$ , where  $R = [0, \pi] \times [0, \pi]$ . Take the sample points to be lower left corners.

- 4) A contour map is shown for a function f on the square  $R = [0,4] \times [0,4]$ .
  - a) Use the Midpoint Rule with m = n = 2 to estimate the value of  $\iint_R f(x, y) dA$ .
  - b) Estimate the average value of f.



5) Evaluate the double integral by first identifying it as the volume of a solid.

a) 
$$\iint_{R} 3 \, dA, \quad R = \{(x, y) \mid -2 \le x \le 2, 1 \le y \le 6\}$$
  
b) 
$$\iint_{R} (4 - 2y) \, dA, \quad R = [0, 1] \times [0, 1]$$