

## **12.1 Double Integrals over Rectangle**

### **Review of the Definite Integral**

### **Volumes and Double Integrals**

### Example 1

Estimate the volume that lies above the square  $R = [0,2] \times [0,2]$  and below the elliptic paraboloid  $z = 25 - x^2 - 2y^2$ .

### Midpoint Rule

### Example 2

Use the midpoint rule with  $m = n = 2$  to estimate the value of  $\iint (x - 3y^2) dA$  where  $R = \{(x, y) | 0 \leq x \leq 2, 1 \leq y \leq 2\}$ .

**Average Value**

**Properties of Double Integrals**

**HW # 1, 3, 9, 11, 13**