

# Double Summation Example 825

Evaluate  $\sum_{k=3}^5 \sum_{i=2}^4 (k-i)^2$

Solution:

$$= \sum_{i=2}^4 (3-i)^2 + \sum_{i=2}^4 (4-i)^2 + \sum_{i=2}^4 (5-i)^2$$

$$= \left( (3-2)^2 + (3-3)^2 + (3-4)^2 \right) \\ + \left( (4-2)^2 + (4-3)^2 + (4-4)^2 \right) \\ + \left( (5-2)^2 + (5-3)^2 + (5-4)^2 \right)$$

$$= (1 + 0 + 1) + (4 + 1 + 0) + (9 + 4 + 1)$$

$$= 2 + 5 + 14$$

$$= 21$$

(end)