

Five different analysts are asked to find the thrust produced by four different mixtures of a propellant. The data that follow are the measurements found. We would like to see if there are significant differences between the mixtures, and also whether the analysts differ from each other.

Analyst	Mixture			
	1	2	3	4
1	40	358	149	103
2	55	350	158	110
3	62	365	132	118
4	50	340	137	97
5	48	353	145	105

An experiment was set up to compare the effect of different soil pH and calcium additives on the increase in trunk diameters for orange trees. Annual applications of elemental sulfur, gypsum, soda ash, and other ingredients were applied to provide pH levels of 4, 5, 6, and 7. Three levels of calcium supplement (100, 200, and 300 pounds per acre) were also applied. All factor-level combinations of these two variables were used in the experiment. At the end of a two-year period, three diameters were examined at each factor-level combination. These data appear below.

pH	Calcium		
	100	200	300
4.0	5.2	7.4	6.3
	5.9	7.0	6.7
	6.3	7.6	6.1
5.0	7.1	7.4	7.3
	7.4	7.3	7.5
	7.5	7.1	7.2
6.0	7.6	7.6	7.2
	7.2	7.5	7.3
	7.4	7.8	7.0
7.0	7.2	7.4	6.8
	7.5	7.0	6.6
	7.2	6.9	6.4

Summary information: Each cell contains: x_{ij} . and \bar{x}_{ij} .

pH	Calcium			
	100	200	300	
4.0	17.4	22.0	19.1	58.5
	5.8	7.3333	6.3667	6.5
5.0	22.0	21.8	22.0	65.8
	7.3333	7.2667	7.3333	7.3111
6.0	22.2	22.9	21.5	66.6
	7.4	7.6333	7.1667	7.4
7.0	21.9	21.3	19.8	63.0
	7.3	7.1	6.6	7.0
All	83.5	88.0	82.4	253.9
	6.9583	7.3333	6.8667	7.0528

$$\sum_{i=1}^4 \sum_{j=1}^3 \sum_{k=1}^3 x_{ijk}^2 = 1,801.51$$