

Minitab

Lecture: Mathematical operations, rows (states), columns (variables), constants

Minitab's **worksheet** is like a spreadsheet with **columns, rows, and constants**:

- **Rows** = individual observations (called *states* or cases).
- **Columns (C1, C2, ...)** = variables.
- **Constants (K1, K2, ...)** = single stored numeric values.
- **Matrices (M1, M2, ...)** = stored sets of data in matrix form.

Some mathematical and statistical conversions

The first case

MTB > Add c1 c2 c3

The second case

MTB > Add c1 c2 c7 c8 c10-c12 c15

The third case

MTB > Add 2 c1 c3

Fourth case

MTB > Add 2 2.4 K1

Fifth case

MTB > Add K1 K2 K3 K4

Subt

The first case

MTB > Subt c1 c2 c3

Interpretation of it

$$C3 = C2 - C1$$

The second case

MTB > Subt 2.3 c2 c4

Interpretation of it

$$C4 = C2 - 2.3$$

The third case

MTB > sub 2 k1 k4

Interpretation of it

$$K4 = k1 - 2$$

multi

The first case

MTB > mult c1 c2 c3

C1	C2	C3
2	3	6
1	2	2
0	1	0
3	4	12

The second case

MTB > mult 22 c1 c4

The third case

MTB > multi k1 k2 k4

Divi

The first case

MTB > Divi c1 c2 c10

Interpretation of it

$$C1/C2=C10$$

The second case

MTB > Divi 2 c1 c11

Interpretation of it

$$2/C1=C11$$

To calculate the absolute value

MTB > let c8= abso(c1)

To calculate the square root

Provided that there are no negative values

The first case

MTB > let c7= sqrt(c1)

The second case

MTB > let k5=sqrt(k4)

Rice

The first case

MTB > let c5 =c1^4

Interpretation of it

$$(c1)^4 = c5$$

The second case

MTB >let c6 =c1^2.5

Interpretation of it

$$(c1)^{2.5} = c6$$

MTB > let k1=2

MTB > let k2=k1^5

To find the sum of a particular column

The first case

MTB > Sum c1 k1

The second case

MTB > SSQ c1 k1

Example: If you have the following equation

$$S^2 = \frac{\sum xi^2 - \frac{\sum xi^2}{n}}{n - 1}$$

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c1
2
3
2
1
4
5
5
6
7
8

MTB > SSQ c1 k1

MTB > sum c1 k2

MTB > let k3=(k2)^2

MTB > let k4=10

MTB > Divi k3 k4 k5

MTB > subt k5 k1 k6

MTB > subt 1 k4 k7

MTB > Divi k6 k7 k8

MTB > print k8

K8 5.34444

Note: We always solve using the indirect method unless specified in the question (using the direct method).

Direct method

MTB >let k1=(ssq(c1)-((sum(c1))^2)/10)/9

MTB > print k1

K1 5.34444

Not: The discrepancy can be found without using the law (direct or indirect method).

Use the following instructions:

MTB >std c1 k2

MTB > let k3=(k2)^2

MTB > print k3

K3 5.34444

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