



INTRODUCTION TO MATLAB

Basic commands, variables and stuff

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00 Exercises

Define the following variables: $a = 3$, $b = -1$, $c = 7$, $d = -c$.

Evaluate the following:

1 $ab - c =$

2 $\frac{a+b}{c} =$

3 $a + \frac{b}{c} + d =$

4 $\frac{a+b}{c} + d =$

5 $\frac{a+b}{c+d} =$

6 $a - bc + 2^a + 2 =$

Add parenthesis to make the expressions clearer

1 $a^b/2^c =$

2 $a*b^c*3 - d =$

00 Order of operations and Unnecessary parenthesis

The order of operations in Matlab is as follows:

- 1. Parentheses ()
- 2. Transpose ('), power (.), matrix power (^)
- 3. Multiplication (.* or *), division (./ or /)
- 4. Addition (+) and subtraction (-)
- 5. Colon operator (:)

When having multiple operators of the same precedence, they are evaluate from left to right. Examples of unnecessary parentheses:

- $((a+b)^c)^d = (a+b)^{c^d}$
- $(a+b)^{(c^d)} = ?$

00 Vectors

- For vectors $A = [-2,-3,-5]$, $B = [2;3;5]$.

$$A' = \begin{pmatrix} -2 \\ -3 \\ -5 \end{pmatrix} = [-2;-3;-5]$$

$$(A')' = A = [-2,-3,-5] = -B'$$

- Evenly-spaced entries in a vector
 - $C = 0:10:100$
 - $C = \text{linspace}(0,100,11)$

00 Exercises for vectors

Define the vectors $A = [-2,-3,-5]$, $B = [2;3;5]$.

- 1 Find the sum of the elements of vector A .
- 2 The inner product in mathematics is defined, for two vectors $X = [a,b,c]$ and $Y = [d, e, f]$, as $X \cdot Y = ad + be + cf$. Find the inner product $A \cdot B$.

Define the vector $C = [1, 2, \dots, 1030]$

- 1 Read out the first three and the last thirty elements of C . Name the result X . Then, $X = [1,2,3,1001,1002,\dots,1030]$
- 2 Create a vector C_{even} with all the even elements (divisible by 2) of C .
- 3 Create a vector C_{odd} with all the odd elements (not divisible by 2) of C .
- 4 Create a vector Y with the elements of C in reverse order.
- 5 Replace the fifth, sixth, ..., twelfth elements of Y with the vector $[10,15,\dots,45]$

00 Commands used

- help
- clc
- clear /clear all
- format short/long
- who, whos
- 6.022e23 (scientific notation)
- exp, sin, cos, ..., log, log10
- ' (transpose)
- linspace, 1:10:100
- size, length, numel