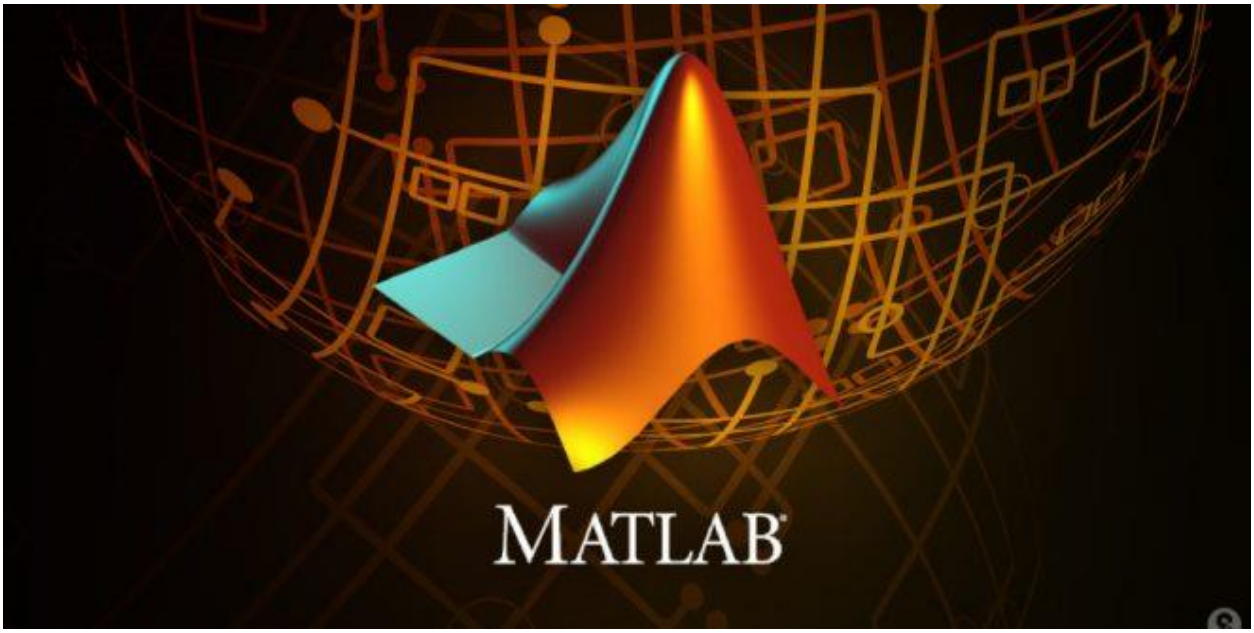
Mohamed Khider University of Biskra, Algeria
Faculty of Sciences and Technology
Department of Civil Engineering and Hydraulics
2nd Year Civil Engineering / Hydraulics / Public Works

Course N°1

Introduction to the MATLAB environment

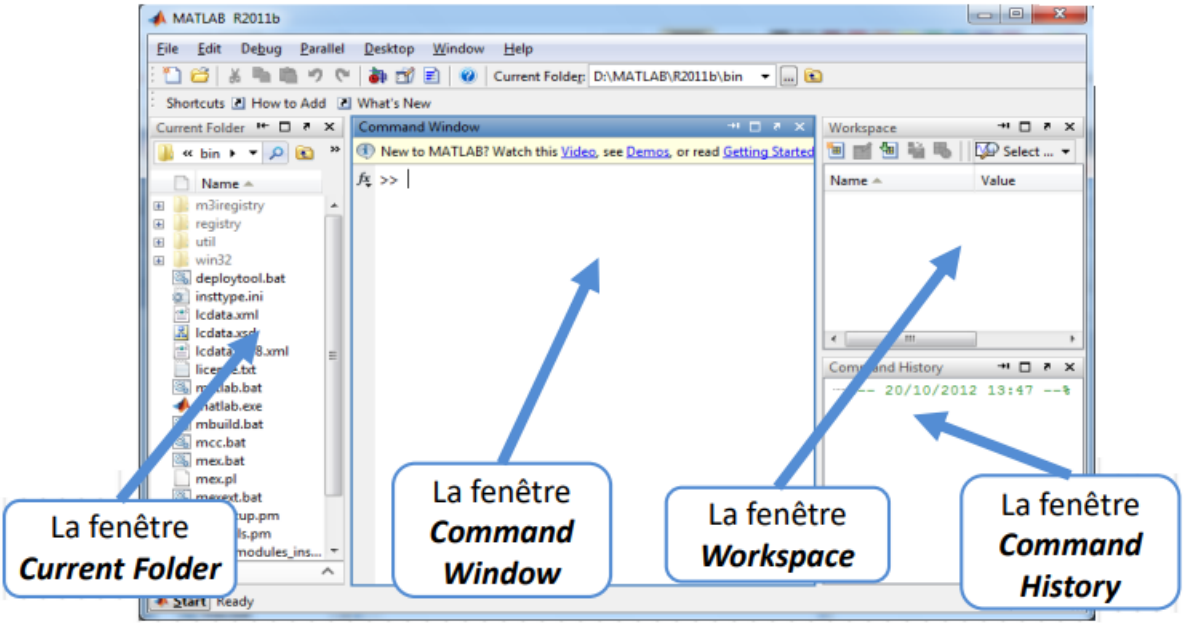


Dr. Salah Djerouni

The MATLAB environment

The MATLAB program displays a number of windows on startup:

- ✓ Current folder : indicates the current directory and existing files
- ✓ Command window : we use it to formulate our expressions and interact with MATLAB, and it's the most widely used window.
- ✓ Command history : keeps track of all commands entered by the user.
- ✓ Workspace : indicates all existing variables with their types and values



Command window	
clear	Deletes all program variables (from memory)
clear x y	Deletes only variables x, y (from memory)
clc	Deletes the contents of the command window screen
quit, exit	Quitter MATLAB
ans	Most recent answer (MATLAB uses a default variable 'ans' to store the result)

Arithmetic operator	
+	Addition (see, Fig 1)
-	Subtraction (see, Fig 1)
*	Multiplication (see, Fig 1)
/	Division left (see, Fig 2)
\	Division right (see, Fig 2)

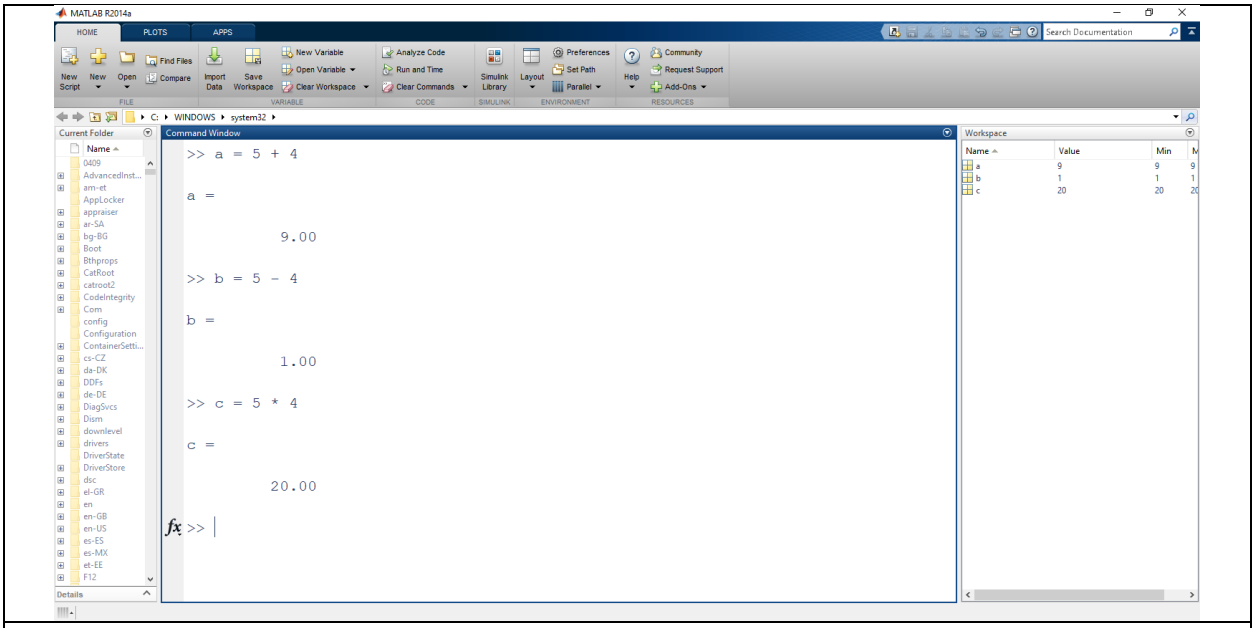


Fig 1. The addition, subtraction and multiplication operations

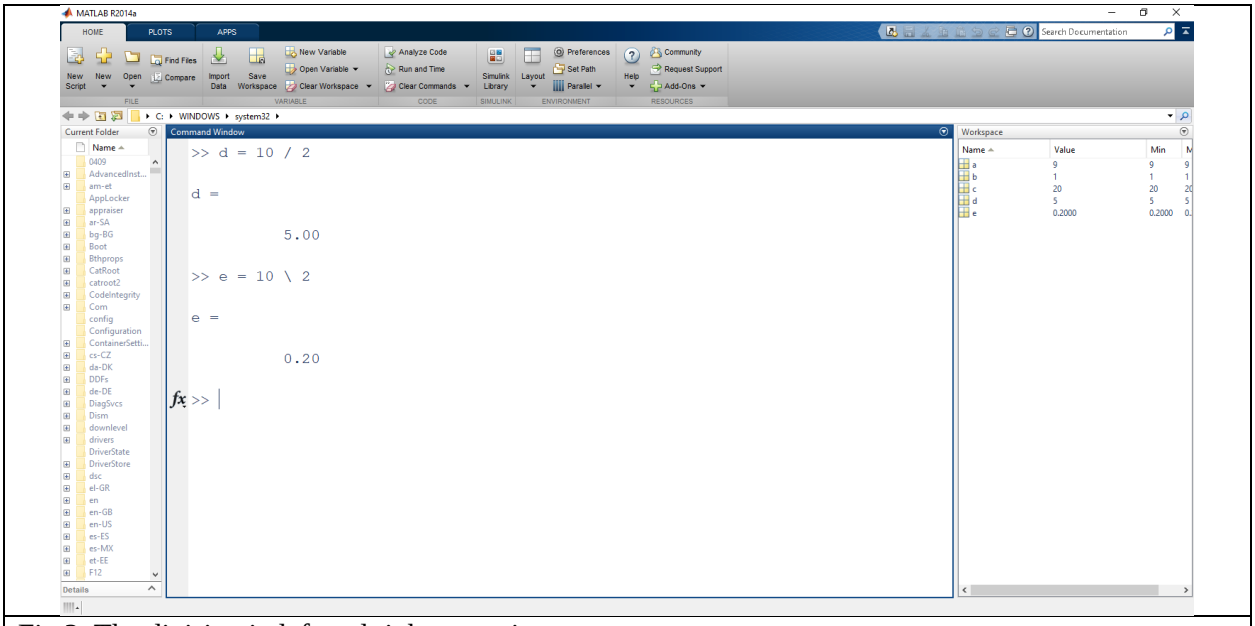


Fig 2. The division in left and right operations

Constants and special characters	
pi	π (see, Fig 3)
inf	∞ infinite, is produced when dividing a non-zero number by zero (see, Fig 3)
NaN	No-Number (Not-a-Number) when there is no digit to display (inf/inf where 0/0) (see, Fig 3)
factorial(6)	$6! = 6\times5\times4\times3\times2\times1$ (see, Fig 3)

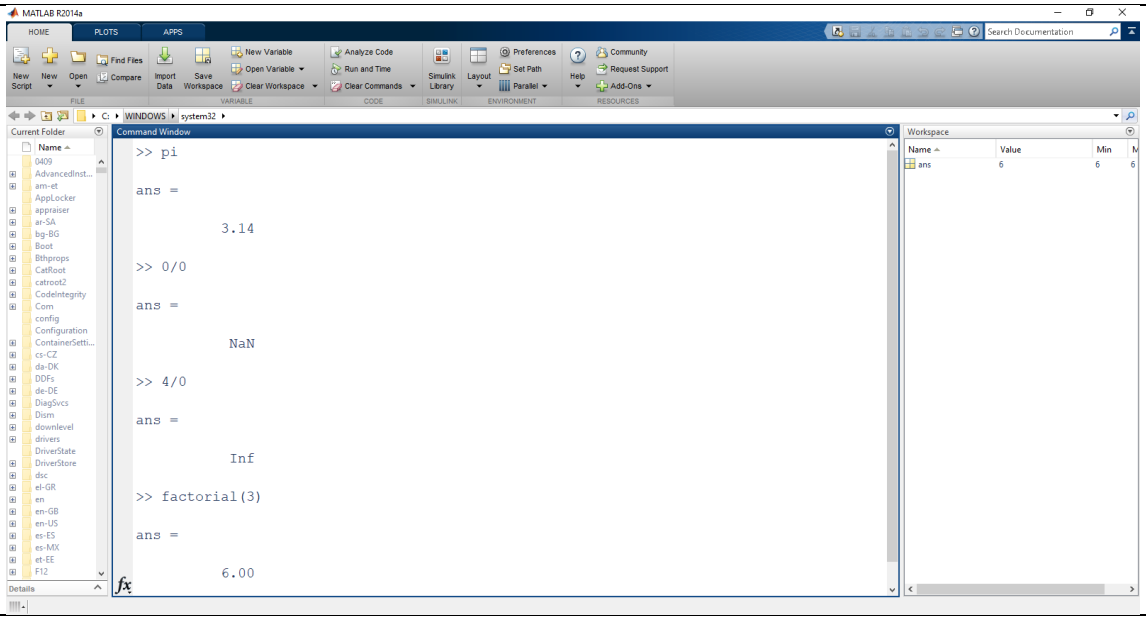


Fig 3. Test some MATLAB commands

Trigonometric functions	
cos(x)	Cosinus (see, Fig 4)
sin(x)	Sinus (see, Fig 4)
tan(x)	Tangente (see, Fig 4)
acos(x)	Arc cosinus
asin(x)	Arc sinus
atan(x)	Arc tangente

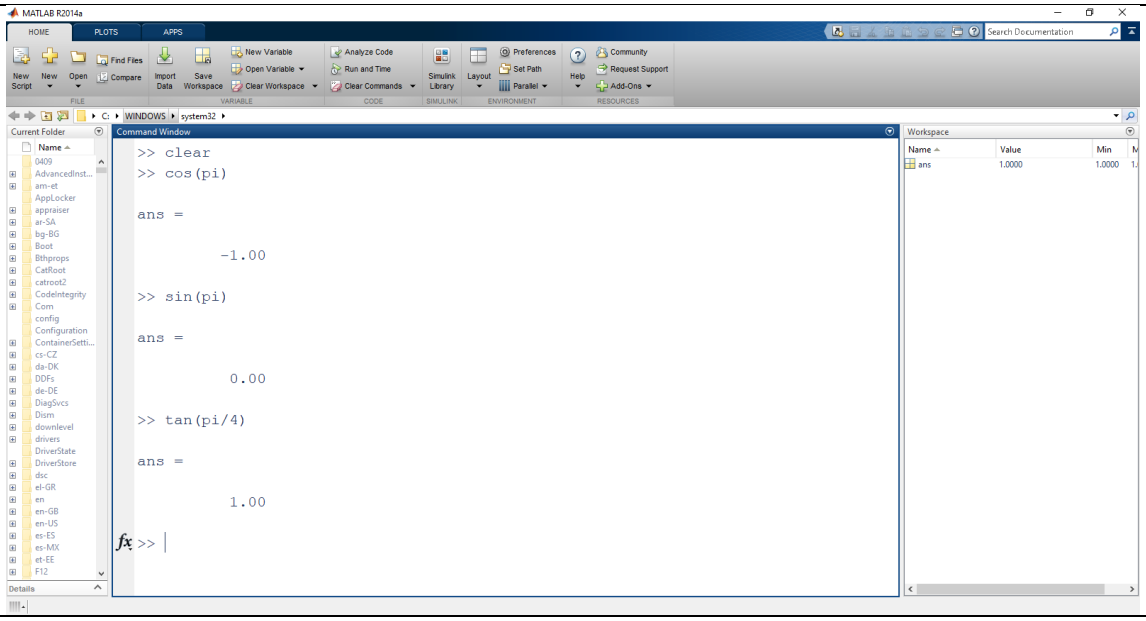


Fig 4. Test some trigonometric function commands in MATLAB

Mathematical functions	
exp(y)	Exponential e^y (see, Fig 5)
log(y)	Neperian logarithm $\ln(y)$ (see, Fig 5)
log10(y)	Decimal logarithm $\log10(y)$ (see, Fig 5)
sqrt(y)	Root $\sqrt{y}$ (see, Fig 6)
x^y	Power (see, Fig 6)
1/y	Inverse y (see, Fig 6)

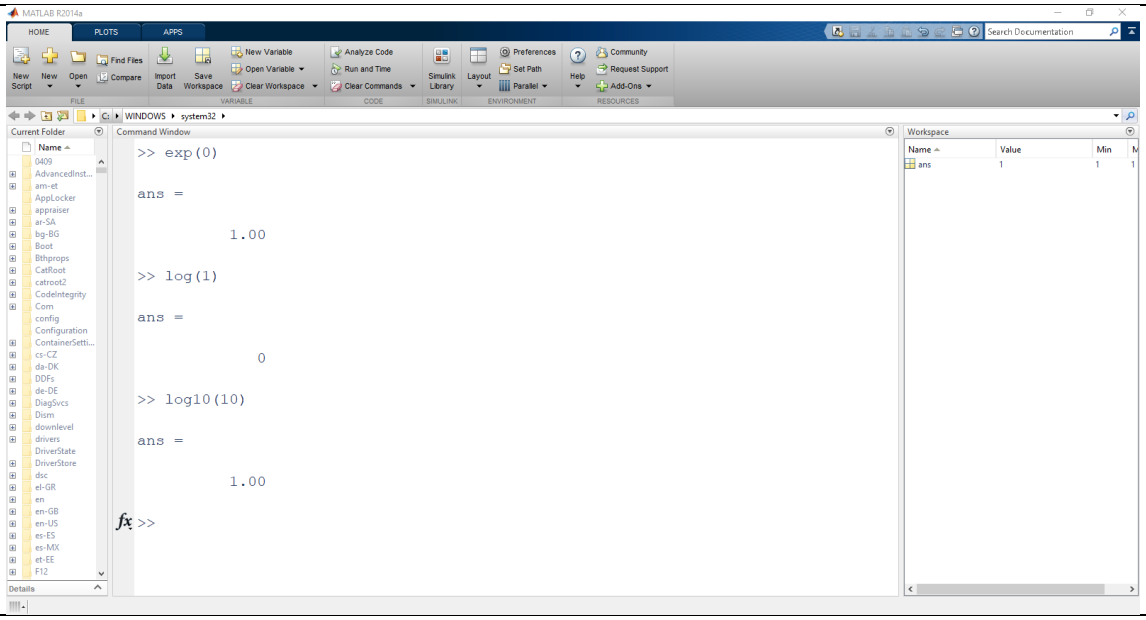


Fig 5. Test some mathematical function commands in MATLAB

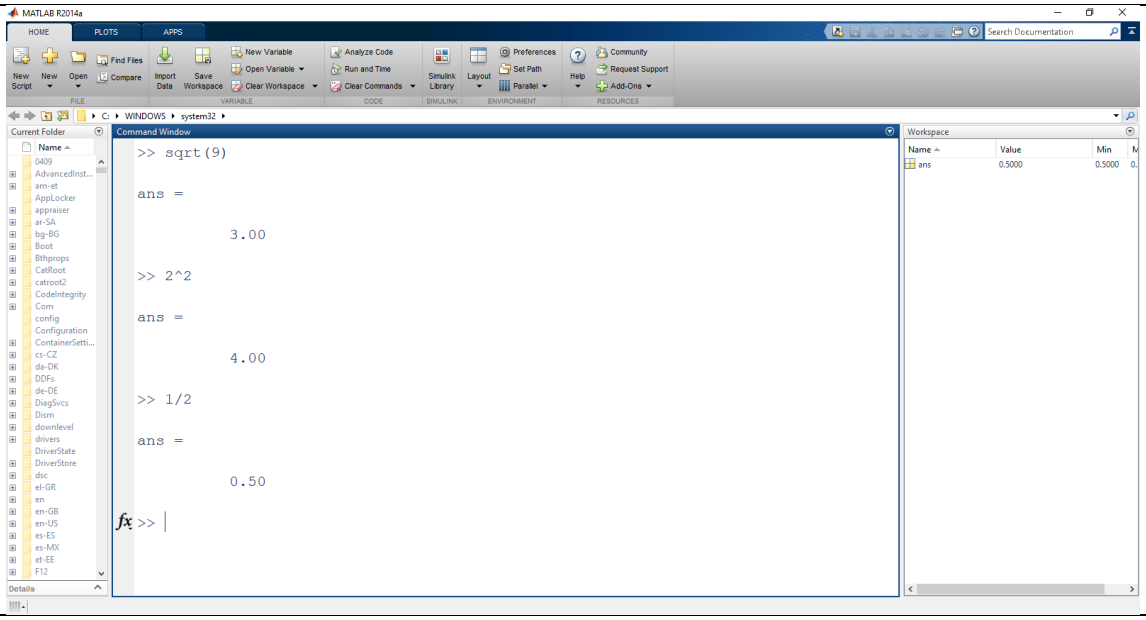


Fig 6. Test some mathematical function commands in MATLAB

Complex variables	
i ou j	Imaginaire pur (i^2=j^2=-1) (see, Fig 7)
real(z)	Partie réelle (see, Fig 8)
imag(z)	Partie imaginaire (see, Fig 8)
angle(z)	Argument θ (en radian) (see, Fig 9)
abs(z)	$\lvert z \rvert$ (see, Fig 9)
conj(z)	Conjugué de z $(\bar{z})$ (see, Fig 9)

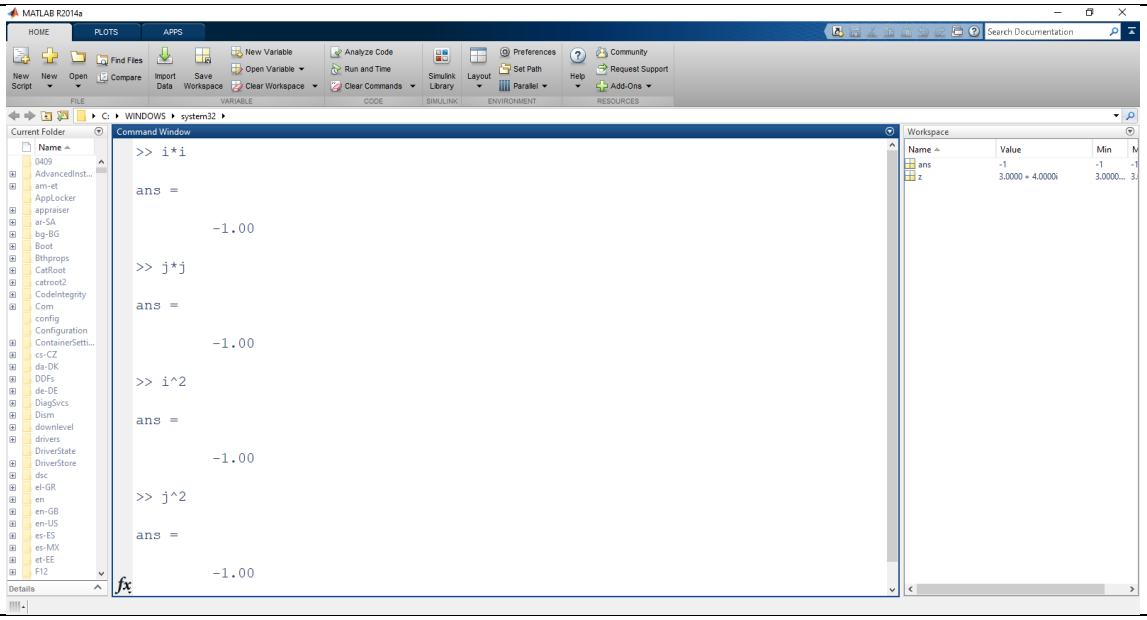


Fig 7. Test some complex variable commands in MATLAB

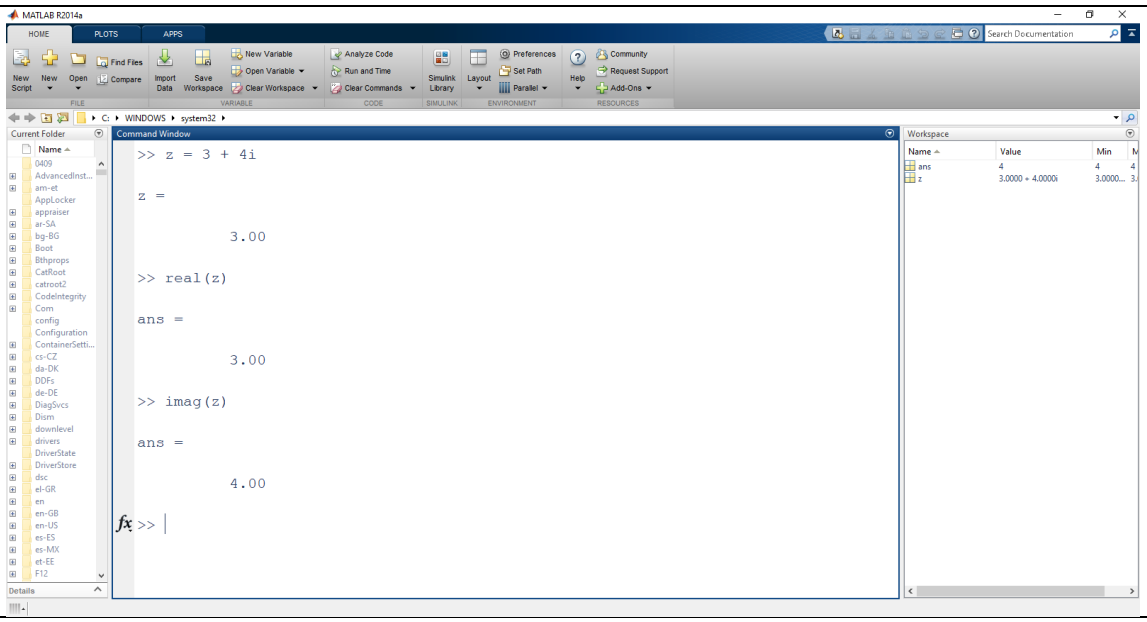


Fig 8. Test some complex variable commands in MATLAB

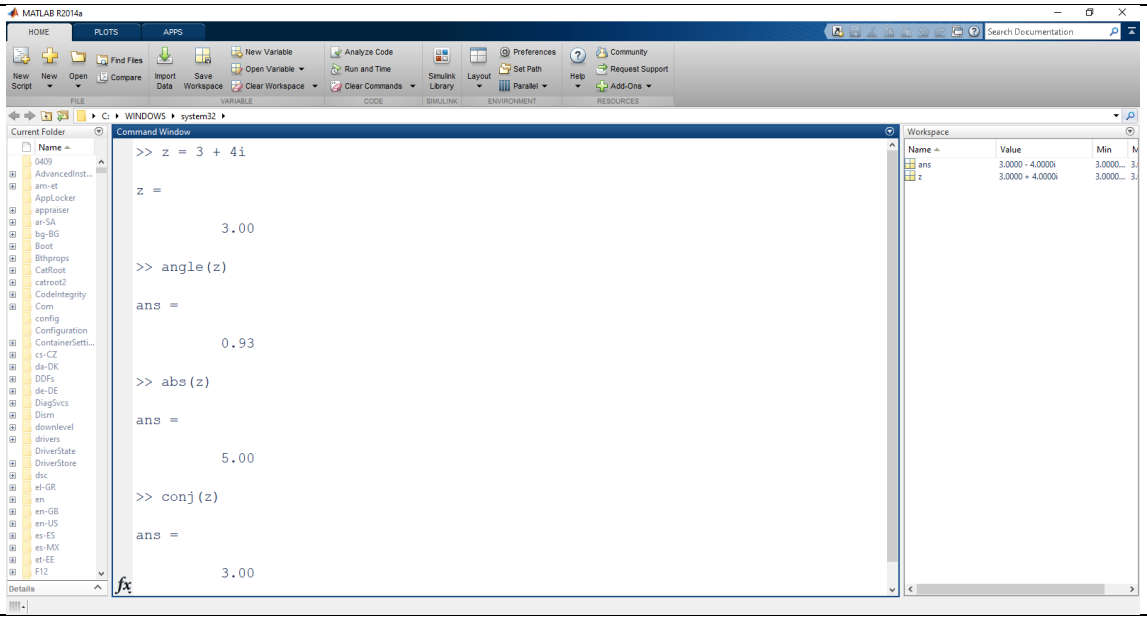


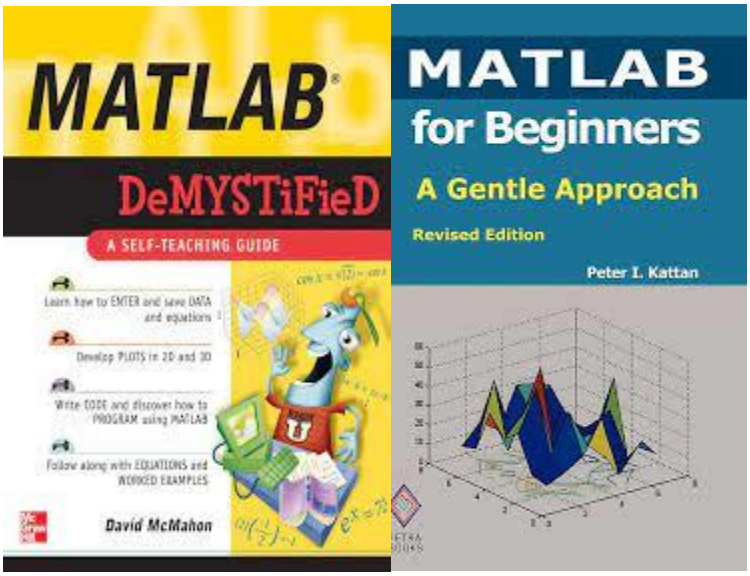
Fig 9. Test some complex variable commands in MATLAB

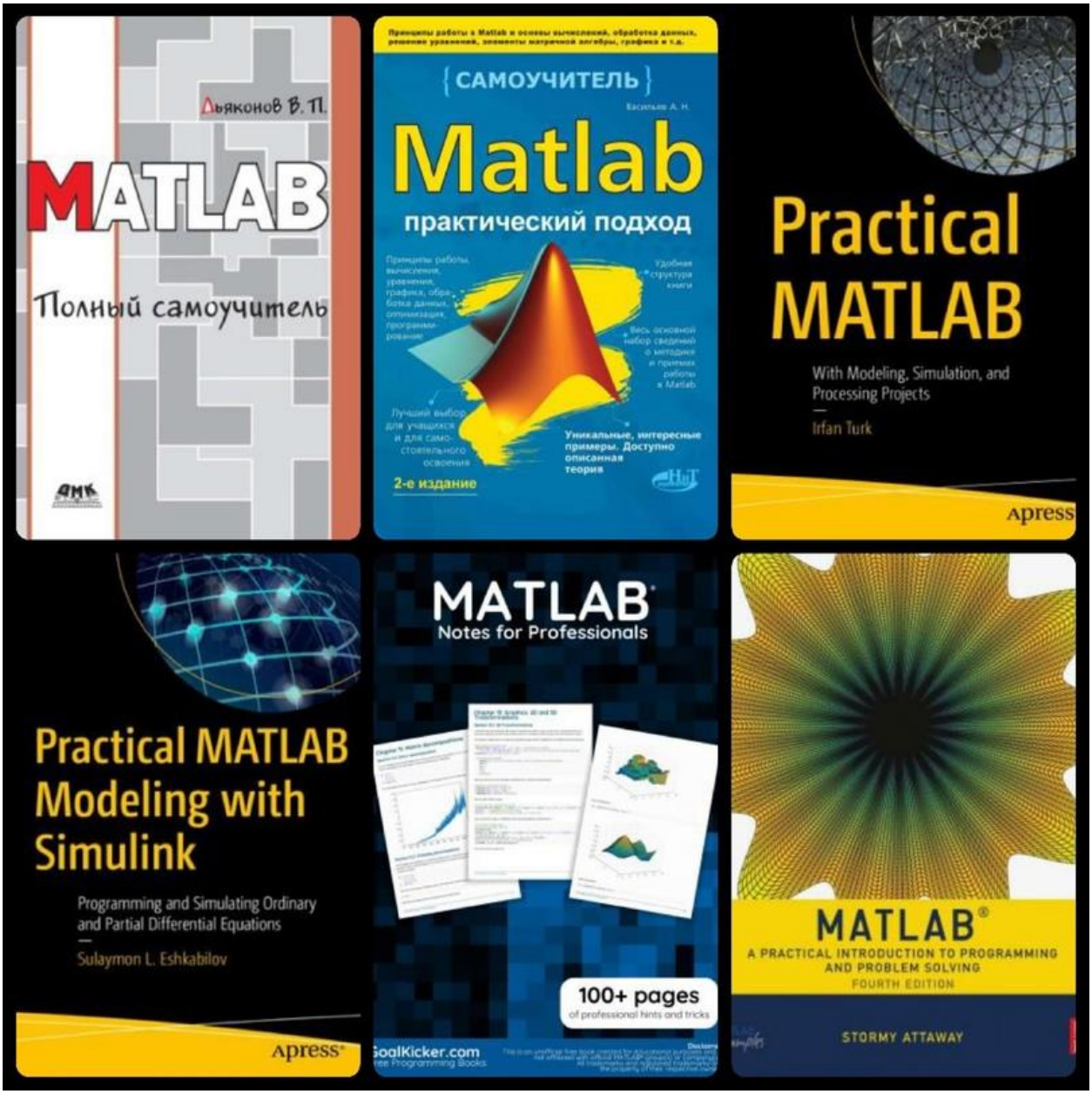
List of References

MATLAB A Practical Introduction to Programming and Problem Solving

MATLAB A Self-Teaching Guide

MATLAB for Beginners


MATLAB
DeMYSTiFieD
A SELF-TEACHING GUIDE
Learn how to ENTER and save DATA and equations
Develop PLOTS in 2D and 3D
Write CODE and discover how to PROGRAM using MATLAB
Follow along with EQUATIONS and WORKED EXAMPLES
David McMahon
MATLAB
for Beginners
A Gentle Approach
Revised Edition
Peter I. Kattan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MATLAB
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Practical MATLAB
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