Operators and Special Characters

`+ - * / ^`	Mathematical operators
`.* ./ .^`	Elementwise operators
`pi`	3.14159...
`NaN`	Not a Number
`Inf`	Infinity
`[ ]`	Create a matrix x = [1, 2; 8, 10]
`( )`	Index into matrix x(1, 2) = 2 Order precedence
`…`	Line continuation
`,`	Separate lines or elements of matrix
`;`	Denote new line and suppress output
`%`	Comment
`'`	Transpose matrix
`' '`	Define character
`" "`	Define string
`=`	Variable assignment
`==`	Equality
`~=`	Not equal to
`> >=`	Greater than / equal to
`< <=`	Less than / equal to
`&`	And
`&&`	Short-circuit And
`|`	Or
`||`	Short-circuit Or

Inputs and Outputs

`display()`	Output to command line
`input()`	Prompt user input
`fprintf()`	Format output
`xlsread()`	Read excel file
`xlswrite()`	Write excel file
`readtable()`	Read .csv file
`table2array()`	Convert table to array

Matrices and Mathematics

`a:b:c`	From a to c by b
`linspace()`	Evenly-spaced array
`sum()`	Sum of array
`mean()`	Average of array
`range()`	Range of array
`size()`	Dimensions of matrix
`max()`	Max value of array
`min()`	Min value of array
`abs()`	Absolute value
`log()`	Natural log
`log10()`	Base 10 log
`sqrt()`	Square root
`e`	Scientific notation (7e2)

`cos()`
`sin()`
`tan()`
	Trigonometric functions

`exp()`	e to the power
`round()`	Round value
`ceil()`	Round up
`floor()`	Round down
`fix()`	Round towards zero
`rref()`	Solve linear equations
`det()`	Calculate determinant
`eye()`	Identity matrix
`zeros()`	Zero matrix
`rand()`	Random value 0 to 1
`randi()`	Random discrete value

Variables & Datatypes

`double()`	Convert to double
`string()`	Convert to string
`char()`	Convert to character
`logical()`	Convert to logical
`true`	Boolean true (1)
`false`	Boolean false (0)

Loops and Statements

`for i = a:b`
`    actions`
`end`
	For loop

`while <true>`
`    actions`
`end`
	While loop

`switch <variable>`
`    case <value 1>`
`        actions`
`    case <value 2>`
`        actions`
`    otherwise`
`        actions`
`end`
	Switch statement

`if <condition>`
`    actions`
`elseif <condition>`
`    actions`
`else`
`    actions`
`end`
	If statement

`break`	Ends loop
`continue`	Begin next loop iteration

Command Line & Setup

`clc`	Clear command window
`clearvars`	Clear variables
`clear all`	Clear everything
`close all`	Close all figure windows
`format compact`	Compact output
`who` `whos`	List workspace variables
`help <function>`	Display help and notes for function
`version`	Display MATLAB version
`why`	Philosophical answers

MATLAB

Syntax Guide

Plotting Commands

`plot()`	2D plot
`plot3()`	3D plot
`loglog()`	Log plot
`semilogx()`	Log plot (x-axis)
`semilogy()`	Log plot (y-axis)
`meshgrid()`	Generate meshgrid
`surf()`	Surface plot
`scatter()`	Scatter plot
`histogram()`	Histogram
`pie()`	Pie chart
`barplot()`	Bar plot
`colorbar()`	Add colorbar
`xlabel()` `ylabel()`	Add axis title
`xlim([ ])` `ylim([ ])`	Axis plot limits
`title()`	Add graph title
`legend()`	Add labeled legend
`text()`	Add text at coordinates
`gtext()`	Add text with click
`grid on`	Add grid to plot
`hold on`	Plot more data on graph
`figure()`	Create new figure
`subplot()`	Specify subplot on figure
`polyfit()`	Obtain fitted coefficients
`polyval()`	Calculate fitted y-data

Plotting Colors

`r`	Red
`b`	Blue
`g`	Green
`c`	Cyan
`m`	Magenta
`y`	Yellow
`k`	Black
`w`	White

Plotting Line Styles

`-`	Solid line (default)
`--`	Dashed line
`:`	Dotted line
`-.`	Dash-dot line

Plotting Shapes

`.`	Point
`o`	Circle
`x`	X-mark
`+`	Plus
`*`	Star
`s`	Square
`d`	Diamond
`v`	Triangle (down)
`^`	Triangle (up)
`<`	Triangle (left)
`>`	Triangle (right)
`p`	Pentagram
`h`	Hexagram

Sample Function .m File

calcRMSE.m	```% Calculate RMSE for Data
function [RMSE] = calcRMSE(y, y_fit)

% Calculate Root Mean Square Error
    a = y - y_fit;
    a2 = a.^2;
    a3 = mean(a2);
    RMSE = sqrt(a3);
end``` |

Sample Anonymous Function

`calcVolSphere = @(r) 4/3*pi*r^3`