

# Graphing calculators

Predefined constants such as pi and e.

Matrix operations, including matrix inverse, determinants, eigenvectors, eigenvalues,

Scientific functions, cos, sin, tan, acos, asin, atan, log, exp,  $x^y$ ,  $1/x$ , ...

User defined functions and limited programming capabilities.

Scientific notation and other formatting options



Support for real and complex numbers,

Memory functions

Graphing in one, two and three dimensions,

Arithmetic operations

Solutions to differential equations

Parameterized plots, curves,

Statistical data analysis capabilities.

# Matlab Command Window

The screenshot shows the MATLAB R2014a interface. The Command Window is the central focus, displaying the following code and output:

```
>> 45
>> y
y =
    @sin

>> z
z =

Columns 1 through 4

11.442698053718898    8.846786269404369    37.387288255333090    34.074010309982455
36.642817173096738    11.298773608921397    26.336884101872592    33.917809242532293
10.958623592624518    27.722010426598761    24.737562373101280    17.120063113891050
41.816863043425251    21.297998200622818    41.273714872341451    25.551973832634950
15.749269469316394    15.824677817834853    12.862755846916810     3.413443030337863

Column 5

2.427755339997322
23.885889885403770
35.062525354590505
42.030480790313234
5.645779381317856
>> |
```

Annotations in the image include:

- A green box labeled "files in the working directory" pointing to the file browser on the left.
- A green box labeled "working directory" pointing to the path in the Command Window toolbar: `/ > Users > calhoun > www > scientific-computing-math-365 > homeworks > Donna > hmwk0 >`.
- A green box labeled "variables in global memory" pointing to the Workspace window on the right.
- A green box labeled "command prompt" pointing to the `>> |` prompt in the Command Window.

Name	Value	Min	Max
ans	1.2246e-16	1.22...	1.22...
f	@(x)x.^2		
fid	3	3	3
h	174.3159	174....	174....
s	'Hello, World'		
x	45	45	45
y	@sin		
z	5x5 double	2.42...	42.0...

# Matlab Editor

The image shows the Matlab Editor interface with a script file open. The script contains the following code:

```
1 function compute_llsq()
2
3 close all;
4
5 N = 10;
6 x = linspace(0,1,N+1);
7 y = 3*x + 0.5*rand(1,N+1);
8
9 p = polyfit(x,y,1);|
10 m = p(1); % Slope
11 c = p(2); % constant
12 y_line = polyval(p,x);
13
14 plot(x,y_line);
15 hold on;
16 plot(x,y, '.', 'markersize',30);
17 title('Linear Regression','fontsize',18);
18 xlabel('x');
19 ylabel('y');
20
21 shg;
22
23
24
25 end
```

Annotations in green boxes with arrows pointing to specific features in the editor:

- multiple files can be open at once**: Points to the tab bar showing two files: `compute_llsq.m` and `compute_exact.m`.
- Hints, warnings and errors are indicated**: Points to the right-hand side of the editor window.
- set breakpoints for debugging**: Points to a red circle on the left margin next to line 12.
- Syntax highlighting**: Points to the code text, where keywords like `function`, `close`, `hold`, `title`, `xlabel`, and `ylabel` are highlighted in blue, and comments are in green.
- line numbers**: Points to the line numbers on the left side of the editor.

The status bar at the bottom right shows the current file is `compute_llsq` at line 9, column 20.