# More Octave/MATLAB resources

## Octave Resources

At the Octave command line, typing **help** followed by a function name displays documentation for a built-in function. For example, **help plot** will bring up help information for plotting. Further documentation can be found at the Octave documentation pages.

## MATLAB Resources

At the MATLAB command line, typing help followed by a function name displays documentation for a built-in function. For example, help plot will bring up help information for plotting. Further documentation can be found at the MATLAB documentation pages.

MathWorks also has a series of videos about various MATLAB features:

### Introduction to MATLAB

| Learning Module | Learning Goals |
|---|---|
| What is MATLAB? | Introduce MATLAB |
| The MATLAB Environment | Navigate the command line, workspace, directory, and editor |
| MATLAB Variables | Use the assignment operator to define scalar variables |
| MATLAB as a Calculator | Perform arithmetic calculations with scalars and functions using MATLAB syntax and order of operations. |
| Mathematical Functions | Use MATLAB variables for input and output to functions. Examples include: COS, SIN, EXP, and NTHROOT. |

## Vectors

| Learning Module | Learning Goals |
|---|---|
| Creating Vectors via Concatenation | Create vectors by entering individual elements |
| Accessing Elements of a Vector | Access specific elements of a vector |
| Vector Arithmetic | Perform arithmetic calculations with vectors including element-wise operations |
| Vector Transpose | Use the transpose operator to convert between row and column vectors |
| Creating Uniformly Spaced Vectors (The Colon Operator) | Use the colon operator syntax to create vectors given the starting and ending values and the size of the interval |
| Creating Uniformly Spaced Vectors (The LINSPACE Function) | Use the LINSPACE function to create a vector. |

## Visualization

| Learning Module | Learning Goals |
|---|---|
| Line Plots | Create a line plot of a vector and customize plot markers and colors |
| Annotating Graphs | Label axes, add a title, and add a legend to a plot |

## Matrices and Arrays

| Learning Module | Learning Goals |
|---|---|
| Creating Matrices | Create matrices by directly entering scalars |
| Array Creation Functions | Create larger matrices and vectors with built in MATLAB functions such as ZEROS and EYE |
| Accessing Elements of an Array | Access elements of an array including entire columns or rows using row-column indexing. |
| Array Size and Length | Use built-in functions to determine array dimensions |

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| Concatenating Arrays | Build larger arrays from smaller ones |
| Matrix Multiplication | Perform matrix multiplication and interpret error messages related to incompatible dimensions. |

## Programming

| **Learning Module** | **Learning Goals** |
|---|---|
| Using the MATLAB Editor | Write a script in the MATLAB Editor, break code into sections to execute, and find help on functions |
| Logical Operators | Use relational and logical operators to create logical variables for program control |
| Conditional Data Selection | Access and change elements for a vector the meet a specified criteria |
| If-Else Statements | Use if-else statements to control which lines of code are evaluated |
| For Loops | Repeat a sequence of commands a specified number of times |
| While Loops | Repeat a sequence of commands while a specified condition is true |

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