

Matlab Tutorials

- (1) *Tutorial #1*: Basic Matlab commands. Type in the following lines one at a time and identify the output.
- (a) `n1=[1:10]`
 - (b) `n1=[1:2:10]`
 - (c) `n2=linspace(1,10)`
 - (d) `n3=linspace(1,10,10)`
 - (e) `n4=linspace(1,10,11)`
 - (f) `a = ones(1,10)`
 - (g) `format long e`
 - (h) `format compact % You can type this earlier also!`
 - (i) `b = [3,.2*a]`
 - (j) `sum(b)`
 - (k) `cumsum(b)`
 - (l) *What happened? Why did it happen?*
- (2) *Tutorial #2*: Finding Limits. Either complete this exercise using the command window or create a *script file* performing the following calculations.
- (a) Construct a list of 11 decreasing powers of 10 from 1 to 10^{-10}
 - (b) Use these to find the following three limits:
 - (i) $\lim_{x \rightarrow 0^+} \frac{e^x - 1}{x}$
 - (ii) $\lim_{x \rightarrow 0^+} \frac{e^x - 1 - x}{x^2}$
 - (iii) $\lim_{x \rightarrow 0^+} \frac{\tan^{-1}(x) - x}{x^3}$
 - (c) Does anything unusual happen when the limits should equal 1, $\frac{1}{2}$ and $-\frac{1}{3}$ respectively?
- (3) *Tutorial #3*: A simple plot
- (a) Construct a list of (100 to 1000) points starting at 0 and going to 6π using the `linspace` command.
 - (b) Use this list (called `t` or anything else) to calculate: $\sin(t)$, $\cos(t)$, $3 * \sin(t) + 5 * \cos(t)$ and $a * \sin(t - c) + 1$ where $a = \sqrt{34}$ and $c = \tan^{-1}(5/3)$.
 - (c) Plot all four functions in the same figure window.
 - (d) What do you notice about them?
 - (e) Can you add on a *black x-axis*?
 - (f) Can you add on circles for all the x-intercepts?
 - (g) Can you add on square for all the maxima and minima?