Mathematica Commands – Prof. Richard B. Goldstein

ALGEBRA

+ - * / ^	symbols used for arithmetic operations
Pi, E	mathematical constants
Exp[z], Sin[z], Log[z], Log[2,z], Sqrt[z]	exponential, sine, natural logarithm, base two logarithm, square root
Solve[*f(x)*==0]	to find roots real or complex

GRAPHICS

Plot[*f(x), {x, xmin, xmax}*]	plot a simple function *f(x)* from *xmin* to *xmax*
Plot[{f_1, f_2, …}, {x, xmin, xmax}]	plot several functions
ParametricPlot[*{x(t), y(t)},{t, tmin ,tmax}*]	parametric plot in 2 dimensions
ParametricPlot3D[*{x(t), y(t), z(t)},{t ,tmin, tmax}*]	3-dimensional space curve

CALCULUS

Limit[*f(x),x->a*]	limit both directions
Limit[*expr*, *x*-> a, Direction -> 1]	computes the limit as *x* approaches *a* from smaller values
Limit[*expr*, *x*-> a, Direction -> -1]	computes the limit as *x* approaches *a* from larger values
D[*f(x),x*] or Derivative[[*f(x), x*]	derivative of *f(x)*
Derivative[k][f(x),x]	k^{th} derivative of *f(x)*
Solve[D[*f(x,.y)*]= =0,y′[x]]	implicit differentiation to find y′
Integrate[*f(x),x*]	indefinite integral of *f(x)*
Integrate[*f(x),{x, xmin, xmax}*]	definite integral from *xmin* to *xmax*
NIntegrate *f(x),{x, xmin, xmax}*]	numerical integral from *xmin* to *xmax*
Sum[*f*, {*i*, *imin*, *imax*}]	starts with *i* = *imin*. to i = *imax* in steps *di*
Series[*expr, {x, a, n}*]	fnds the Taylor Series expansion of the expression around *x* = *a*

Note: Always use a Shift with the Enter key after each line.
These operations can be nested.