This should cover almost all of the Maple commands you'll need for the semester, although others will certainly come up at other times. Don't be afraid to explore and play around!

General Issues

- Every line must end with a semi-colon.
- Always include the `*` for multiplication, like `3*(x+y)` for $3(x+y)$.
- Maple is case-sensitive: `plot` is **not** the same as `Plot`.
- The **Expression** palette is very handy for providing a template for many of the expressions you'll need during the semester.
- The **Help** menu is your friend. Use it to find the exact syntax and options for the commands.
  The **Help - Basic How To** has a good overview of most of the commands you'll need this semester.
- The **Tools** menu also has some useful options under **Assistants** and **Tutors** that might be useful to check out.
- If you get a question mark at the Maple input line, you need to set the Input Display to Maple Notation through the menu **Maple 9.5 - Preferences - Display - Input Display - Maple Notation**. Click on **Apply Globally**, and then you shouldn't have to do this again.

Basic Expressions and Functions

`restart;`	Clears all definitions and reinitializes Maple
`Pi`	The constant π. Notice the *capital P*
`exp(x)`	The natural exponential function e^x To get the constant e, you use `exp(1)`
`sqrt(42+x)`	Just as you exptect, this is $\sqrt{42+x}$
`%`	Is the output from the last *executed* statement This is handy to perform on operation on the last output.
`w := x^2;`	Defines w to be the expression x^2 Whenever Maple sees `w`, it will substitute x^2
`unassign('w');`	Unassigns w
`f := x -> x^3 + cos(x);`	Defines a *function* $f(x) = x^3 + \cos(x)$ Then $f(Pi)$ would be $\pi^3 + \cos(\pi) = \pi^3 - 1$
`simplify( );`	Attempts to algebraically simplify an expression
`solve(x^2+6x-5=0);`	Tries to solve the equation *exactly* without decimal approximation

`Diff(cos(x^2)*tan(x), x);`
`Int(cos(x^2)*x^2, x);`
`Sum( sin(i^2), i=1..30);`
	The inert form of the differentiation function.
	The inert form of the antidifferentiation function.
	The inert form of $\sum_{i=1}^{30} \sin(i^2)$.
	These are handy to check that you've entered the expression correctly.

`value( );`	The *exact* value of an expression. You can combine this with the `Diff( )`, `Int( )`, or `Sum( )` commands to find a value.
`evalf( );`	A numeric approximation of a value

Basic Plots – Be sure to check the options for these commands

`plot(sin(x), x=-2..Pi);`	Plots $\sin(x)$ for $-2 \le x \le \pi$
`plot([x^2, sin(x)], x=-2..Pi);`	Plots the two functions x^2 and $\sin(x)$ for $-2 \le x \le \pi$ on the same set of axes
`plot([cos(t), sin(t), t=0..Pi]);`	Plots the parametric curve $(\cos(t), \sin(t))$ for $0 \le t \le \pi$ Notice that t is *inside* the square braces.
`plot3d( sin(x)*cos(y), x=-3..3, y=0..5);`	A 3-D plot of $z = \sin(x)\cos(y)$. You can also use the options `coords=cylindrical` and `coords=spherical` to plot in other coordinate systems.

The Plots Package – Be sure to check the options for these commands

`with(plots);`	Loads the `plots` package which is need for the rest of the commands in this section. Most of these commands are self-explanatory.
`polarplot(sin(2*theta), theta=0..2*Pi);`	
`contourplot( x^2-y^2, x=-5..5, y=-5..5);`	You might want to use the `filled=true` and/or `coloring=[blue,red]` options.
`densityplot(x^2-y^2, x=-5..5, y=-5..5);`	I often like to sue the options `colorstyle=HUE`, `style=PATCHNOGRID`, and `grid=[100,100]`, although you'll want to be careful with how large you make the grid.
`fieldplot([x-y,2*x], x=-5..5, y=-5..5);`	The `grid=[10,10]` option will determine how many vectors are graphed.
`gradplot(x^2-y^2, x=-5..5, y=-5..5);`	
`spacecurve([sin(t),cos(t),t], t=0..20);`	Plots a parametric curve in 3-D
`implicitplot( x^2/4 + y^2=1, x=-5..5, y=-2..2);`	A 2-D implicit plot. Notice that you must give bounds for both x and y
`implicitplot3d( x^2/4 + y^2+z^2/9=1, x=-2..2, y=-1..1, z=-3..3);`	A 3-D implicit plot
`p1:=plot3d(12-x^2-y^2, x=-3..3, y=-3..3):` `p2:=plot3d(x+y+3,x=-3..3,y=-3..3):` `display(p1,p2);`	Allows you to display multiple plot structures on the same set of axes. Notice the colon at the end of the first two lines. This suppresses the output from these commands.

A Few Other Commands

`with(student);`	Loads the `student` calculus package which is needed for the commands `leftsum( )`, `rightsum( )`, `middlesum( )`, `leftbox( )`, `rightbox( )`, and `middlebox( )`.
`leftbox( cos(x^2), x=-1..2, 20);`	Shows a graph of L_{20}, the left sum with 20 subdivisions, for the integral $\int_{-1}^{2} \cos(x^2)\,dx$.
`leftsum( cos(x^2), x=-1..2, 100);`	Computes L_{100} for $\int_{-1}^{2} \cos(x^2)\,dx$. You will need to use `value(%);` or `evalf(%);` to get the value.
`with(linalg);`	Loads the `linalg` package which is needed the commands `dotprod( )`and `crossprod( )`
`dotprod([1,2,3],[4,5,6]);` `crossprod([1,2,3],[4,5,6]);`	