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.
- Don't be afraid to explore and play around!

Some of the commands you'll need this semester are on the back of this sheet.

Basic Expressions and Funcions

`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);`	The inert form of the differentiation function.
`Int(cos(x^2)*x^2, x);`	The inert form of the antidifferentiation function.
`Sum( sin(i^2), i=1..30);`	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
`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.

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
`with(plots);`	Loads the plots package which is need for the rest of the commands in this section
`polarplot(cos(2*theta), theta=0..2*Pi);`	Plots the polar curve $r = \cos(2\theta)$ for $0 \le \theta \le 2\pi$
`p1:=plot( ); p2:=plot( ); display(p1,p2);`	Allows you to display multiple plot structures on the same set of axes
`tubeplot([x,0,0], x=0..4*Pi, radius =sin(x)+2);`	This will draw the surface obtained by rotating the graph of $y = \sin(x) + 2$ about the x-axis from $x = 0$ to $x = 4\pi$.