**Chapter 2 Short Summary**

\* *Execution groups*

-> Insert an execution group using the toolbar icon [>.

-> Press enter to execute execution group.

-> To insert text in an execution group, insert a paragraph

(Insert menu->paragraph)

-> Remove an input prompt (>) to display only text in an execution group by using (Insert menu-> text menu).

Or better, hide execution group delimiter by using Format/Create Document Block menu item.

Or insert text below stack of execution groups by clicking the T button on the toolbar.

-> Use ‘Expand Execution Group’ and ‘Collapse Execution Group’ items in View menu to turn execution groups on and off.

\* *Output labels*

(i.e. the label on the right side of an output (after evaluating by pressing enter))

-> Press (ctrl & L) or go to (Input menu-> Label) to reuse an output. Type in the number of the output label in ‘identifier’.

(\* *Maple worksheet* vs *Maple document*)

Maple worksheets contain only execution groups. Maple documents may contain no execution groups.

\* *π* and *e*

-> Use the common symbols palette for *π* or *e*. (Maple will not recognize them if you type it).

\* *Inequality* symbols

-> Available in the Common Symbols palette.

-> Or,

can be typed as <=, >=

can be typed as either <> (in Maple) or != (which only works in Math mode)

\* *Naming Functions*

-> Write a function by stating a name followed by parentheses () with no spaces between the name and parentheses. It can contain arguments separated by commas, or no arguments between the parentheses. e.g. ln(1), sec(theta), *f(x), g(), foo(a, b, c)*

-> Remark: functions that are recognized by maple are switched from italic to roman font.

-> Remark: Maple language is case-sensitive, e.g.

**** = . Lower case letters are used for most functions.

-> Remark: You can include a space at the start of a name with backward quotes, e.g. , to avoid conflict with the  function built into Maple. (This is useful when trying to re-use predefined names. Arguably a better approach is to use the  function; see Maple help for details.)

\* *Important functions:*

-> In maple log(x)=ln(x).

**> **

 = 

**> **

 = 

**> **

 = 

**> **

 = 

**> **

 = ****

*Trig functions* names: sin, cos, tan, sec, csc, cot. *Trig inverses* have "arc" prepended. The *hyperbolic* analogues of the trigonometric functions have the same names with "h" appended, e.g. arcsinh(0).

-> Use function *convert*, to convert trig functions from radians to degrees. (see maple help)

-> Remark: maple only returns the principal value of multivalued functions. To get other values, you must construct it yourself. e.g. sqrt(4)=2. –sqrt(4)=-2.

\* *Operators*

-> (Types: Binary, Unary, Postfix, Prefix, Infix.)

-> Found in common symbols or operator palettes. (Warning: not all symbols found here have the meaning you might expect).

-> Operators can be used as function names if enclosed in backward quotes, e.g. **** = ****. (This is especially useful for applying the operator on several inputs).

\**Range Operator*

A range is specified using the range operator .., which is two full stop symbols next to each other. e.g. $x=a ..b$

(Remark: $x=a ..b$ could correspond to any of , , ,  which Maple determines by its context).

\* *diff()*

**> **= 

**> **= 

**> **= ,  = .

-> *diff()* differentiates the first argument with respect to the second argument.

-> Remark: If the first argument does not contain the second the result is zero since maple assumes it is differentiating a constant.

-> Remark: Another way to evaluate the nth derivative (than the **** method) is to use the syntax: e.g. *diff(f(x), x, x, x)*=*diff(f(x), x$3)*.

-> Remark: *diff()* returns the partial derivative for functions of more than one variable.

\* *int()* or *integral()*

**> **= 

**> ** = 

*-> int()* integrates the first argument with respect to the second argument.

-> Remark: If the second argument is just a variable then *int()* performs indefinite integration, but never includes the constant of integration. If you want one then you provide it yourself, i.e. ****

-> Remark: If second argument is a range then int() performs definite integration over the range.

\* *Floating Point Approximation* and *evalf()*

-> Floating-point numbers are treated as approximations.

e.g. sqrt(.5) = 0.7071067812, whereas sqrt(1/2) = (1/2)sqrt(2).

(Remark: If there is an approximation in an expression, then Maple approximates the whole expression. However, symbols and functions that are separate are not affected.)

-> Or, use the function *evalf()* to perform floating point approximation.

(See notes 3 for more on evalf())

\* *op()* function

->1 argument in the op function extracts the operands of an expression and outputs them as a list.

-> 2 arguments, with the first a number, extracts the specified operand

e.g.

**> **



**> **



**> **



**> **

Error, improper op or subscript selector

**> **



**> **



**> **





**> **



*op()* also supports a more succinct syntax using a list as the first argument:

**> **



\* *whattype()*

Use the function *whattype()* with the input argument in quotes to determine what kind of expression the input is. (Useful for interactive purpose, not in programs). e.g.

**> **



**> **



**> **



**> **



e.g.  = ,  = ,  = ,  = .