1.3f Doing Algebra with Maple

Maple is a computer algebra system. To use it we:
- type a command at the prompt (the > symbol),
- finish the command with a semicolon (the ; symbol),
- press the Enter key with the cursor anywhere in the command line to execute it.

To solve the equation $a\,x + b\,y = c$ for x we use this command:

```
> solve(a*x+b*y=c,x);
```

$$-\frac{b\,y - c}{a}$$

Notice that the result is printed on the next line after the command. We can assign a complicated expression or equation to a variable (using the := symbols). This is useful to verify that we entered it correctly. For example here we solve the equation from Example 1.27.

```
> eqvar:=x/(5+x)^2=6*x/(5+6*x/(6+x))^2/(6+x);
```

$$eqvar := \frac{x}{(5+x)^2} = \frac{6\,x}{\left(5 + \dfrac{6\,x}{6+x}\right)^2 (6+x)}$$

```
> solve(eqvar, x);
```

$$0, 0, \frac{15}{2}, -\frac{10}{3}$$

Notice that the solve command gives the solution in exact form (in this case as a list of integers and fractions). Here is the equation from Example 1.30.

```
> eq2:=x=1/x+1/(x-5);
```

$$eq2 := x = \frac{1}{x} + \frac{1}{x-5}$$

If we try the solve command on this we get an exact solution but it is so complicated that it is gibberish. It is better to ask for a numerical (approximate) solution using the fsolve command. We have to specify the interval that contains the root just as we did for the bisection method. Here is how we look for the root in the interval between 4 and 6:

```
> fsolve(eq2, x=4..6);
```

$$5.200$$

To control the number of sig. figs. used in the course of a calculation we can use the Digits command. To control the number of decimal places displayed in an answer we can use the interface command.

```
> Digits:=16;
> interface(displayprecision=3);
```

Some other useful commands are plot to plot a graph, expand to expand an expression, factor to factor an expression and simplify to simplify an expression or to add fractions. To get help on any topic press ctrl-F1.