A Brief Introduction to basic Maple commands

In this worksheet, we’ll introduce some of the basic commands that make math 23 a little easier to bear. First, let’s review the very basics - defining functions and evaluation. Maple use := to make a definition. For example

\[
> f:=x^2+\sin(x);
\]

\[
f:=x^2 + \sin(x)
\]

This command assigns the label "f" to the expression \(x^2+\sin(x)\). Since this is differential equations, we need to differentiate. The next command reads "Differentiate the expression \(f\) with respect to the variable \(x\)"

\[
> \text{diff}(f,x);
\]

\[
2x + \cos(x)
\]

Note, you don’t need to define \(f\) to use this:

\[
> \text{diff}(x^2+\exp(x)+\ln(1-x),x);
\]

\[
2x + e^x - \frac{1}{1-x}
\]

Next, we plot the function on the interval -2 to 2 using the command plot.

\[
> \text{plot}(f,x=-2..2);
\]

And now, integrate with respect to \(x\) (the indefinite integral):
\[
\int f(x) = \frac{1}{3}x^3 - \cos(x)
\]

Note that there is no integration constant here so be careful. If you want a definite integral, simply provide bounds:

\[
\int_{1}^{3} f(x)
\]

This is the value of the integral of \( f \) from \( x=1 \) to \( x=3 \). If you want a decimal approximation of the number, use the \texttt{evalf} command. The \% sign is \texttt{maple}'s way of saying "use the last this I evaluated here".

\[
\texttt{evalf(\%)}; \quad 10.19696147
\]