Starting a Maple 11 document

A routine assignment in this class will be to turn in a Maple problem in document mode. For these problems you are being asked to use Maple as a technical word processor for doing a clean write-up of a problem. This document is intended to walk you through such an assignment.

Inserting Text

When you use Maple to create a new Maple file, the default is that Maple uses the document mode. Visually, you start with a blank sheet of paper, with the cursor in the upper left hand corner, slanted to type italics. That means that you are in 2-D math mode. We will get to math in a minute. Hitting control-C (PC) or command-T (Mac) shifts you to text mode. You can then use the paragraph style drop down menu to choose a style. Note that the menu bar lets you make the style changes one typically finds on a word processor.

Exercise 1) In the space between the two rows of asterisks, enter three lines of text. The first should use the Title style, the second the Author style, and the third, the Normal style.

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Now is the time for all good men to come to the aid of their country

A second line line of test.

Hi There

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Adding Math Formulas

One of the advantages of using Maple is that it allows easy incorporation of mathematics objects like graphs and equations. The math input can go in either a 1-D or a 2-D layout. To use the 2-D layout either use the insert menu or control-R/command-R. You can tell that you are in 2-D Input mode by looking at the cursor or by looking at the tool bar at the top of the page. For 2-D math mode, the cursor is slanted like it is doing italics. The Math button on the tool bar is highlighted, and the style menu indicates "2-D input." Math commands are executed with return or enter. Move the cursor to the commands below and execute them.

$hyp := \sqrt{3^2 + 4^2}$

$$5 \qquad (2.1)$$

hyp

$$5 \qquad (2.2)$$

$$\sin\left(\frac{\pi}{6}\right)$$

$$\frac{1}{2} \qquad (2.3)$$

$$ifactor(100!)$$

$$(2)^{97}\,(3)^{48}\,(5)^{24}\,(7)^{16}\,(11)^{9}\,(13)^{7}\,(17)^{5}\,(19)^{5}\,(23)^{4}\,(29)^{3}\,(31)^{3}\,(37)^{2}\,(41)^{2}\,(43)^{2}\,(47)^{2}\,(53)\,(59)\,(61)\,(67)\,(71)\,(73)\,(79)\,(83)\,(89)\,(97) \qquad (2.4)$$

Exercise 2: In the space between the two rows of asterisks, Switch to 2-D math input mode. Enter three mathematical commands and execute them.

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$$1 + 1;$$

$$2 \qquad (2.5)$$

$$\sin\left(\frac{Pi}{2}\right);$$

$$1 \qquad (2.6)$$

$$evalf(\pi, 30)$$

$$3.14159265358979323846264338328 \qquad (2.7)$$

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Adding Plots

As was mentioned above, we can also include graphs in Maple documents. Maple will let us graph a number of curves on the same graph.

$$plot(sin(x), x = 0..10)$$

$$plot\left(\left[sin(x), x, x - \frac{x^3}{6}, x - \frac{x^3}{6} + \frac{x^5}{5!}\right], x = -2\cdot\pi..2\cdot\pi, y = -4..4\right)$$

Exercise 3: In the space between the two rows of asterisks, Switch to 2-D math input mode. Plot two graphs.

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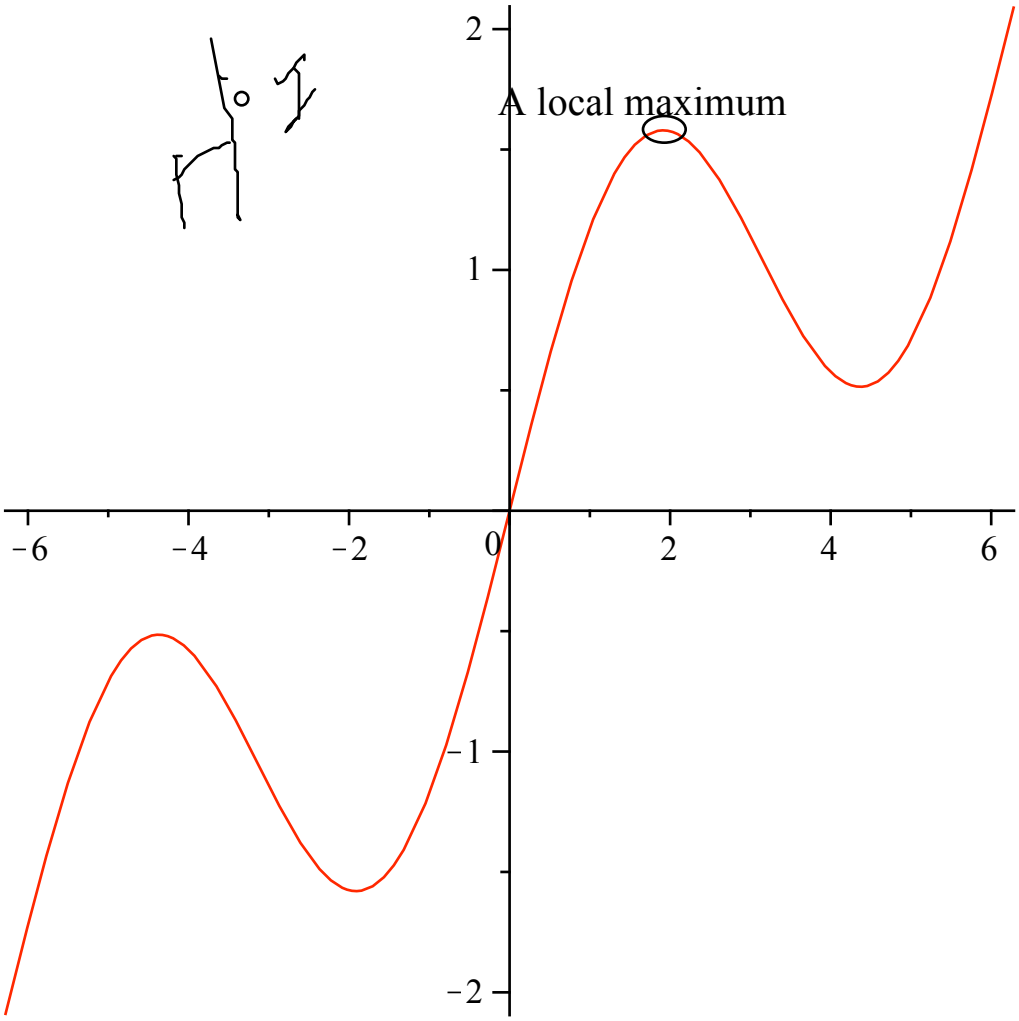
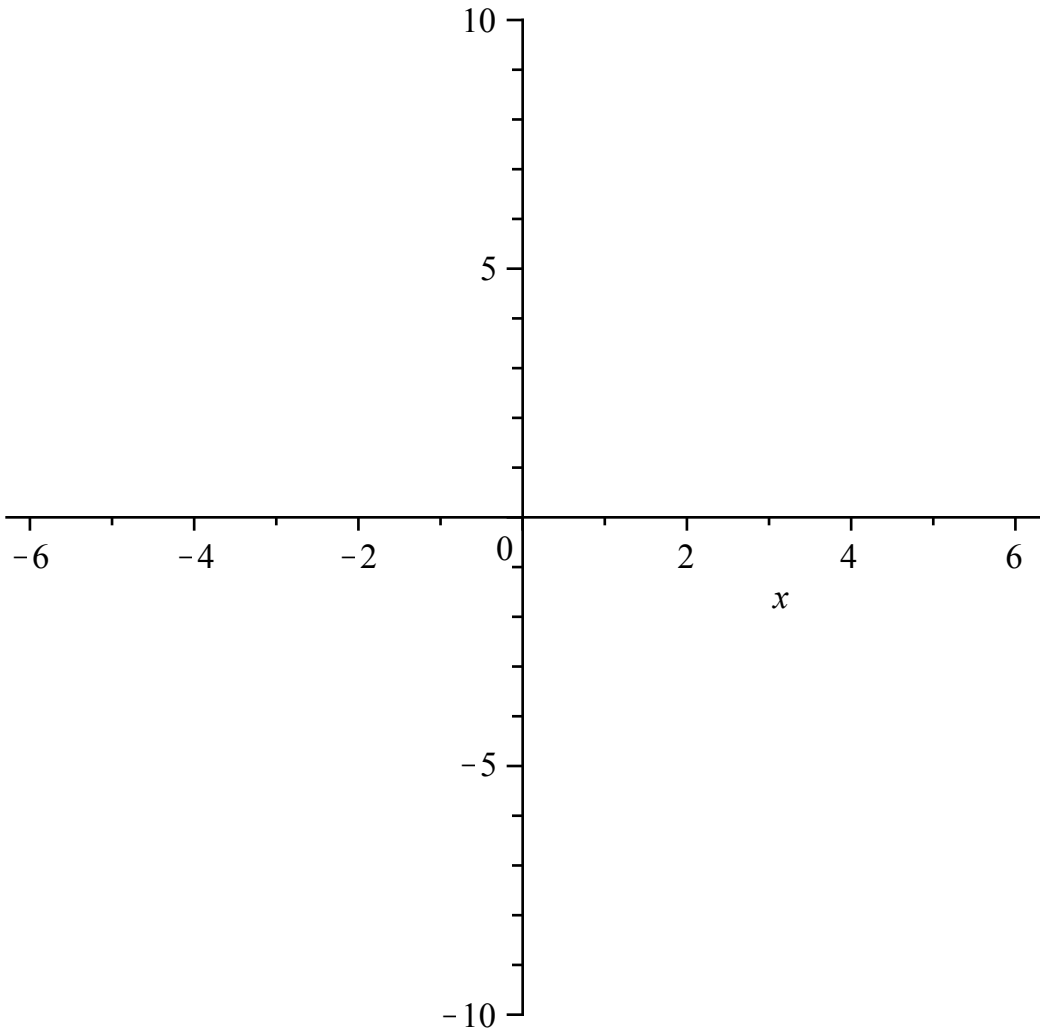
With Maple 11 you can also add annotions to a graph. In the example below we plot an easy figure and then mark and label the local minima and maxma.

$$plot\left(\sin(x) + \frac{x}{3}, x = -2\cdot\pi..2\cdot\pi\right);$$


A local maximum
2
1
−1
−2
−6
−4
−2
0
2
4
6



Exercise 4: In the space between the two rows of asterisks, Switch to 2-D math input mode. Plot a graph and anotate several interesting features.

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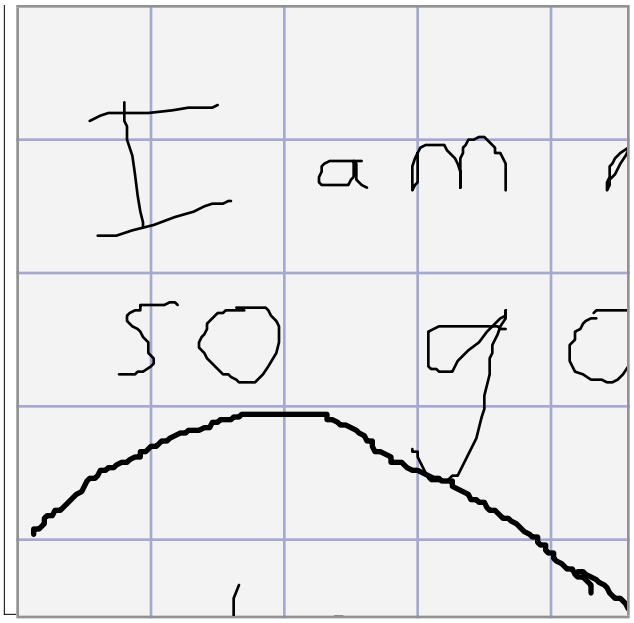
Tables and Other Features

One nice feature for writing mathematics with Maple is the Table feature from the Insert menu. This feature lets you put objects and explanations together. It allows for side by side comparison.

We start with a table entry that is simply text. In a second block we will insert a sketch. This lets you include freehand sketches as part of your work. As my sketch indicates, it takes a while to gain skill in sketching with a mouse. (I find sketching with a trackpad to be even harder.)	



$f := x \rightarrow x^2 + 1$

Spreadsheet(1)

	A	B	C
1	x	$f(x)$	
2	1	2	
3	2	5	
4	3	10	

The second insertion will be a spreadsheet. The syntax is a little different that you will have seen with Excel. Cell references begin with a tilde, "~", so the entry in cell B2 is "f(~a2)".

For the third insertion we will use a demonstration of how Riemann sums with the left hand rule can be used to approximate an integral.

$f := x \rightarrow x^2 + 1;$

$$x \rightarrow x^2 + 1 \qquad \textbf{(4.1)}$$

$n := 1000;$

$$1000 \qquad \textbf{(4.2)}$$

$a := 1;\ b := 3;$

$$1$$

$$3 \qquad \textbf{(4.3)}$$

$delx := \frac{b - a}{n};$

$$\frac{1}{500} \qquad \textbf{(4.4)}$$

$Approx := sum(f(a + i \cdot delx) \cdot delx, i = 0 .. n - 1)$

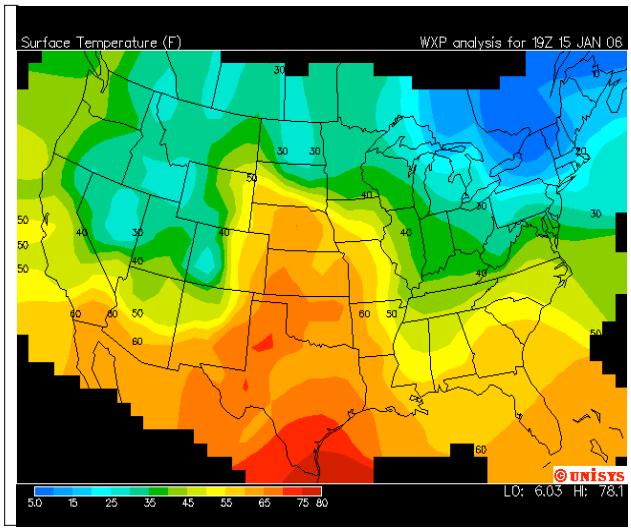
$$\frac{2664667}{250000} \qquad \textbf{(4.5)}$$

$$SymInt := int(f(x), x = a..b)$$

$$\frac{32}{3} \qquad (4.6)$$

$$evalf(SymInt - Approx)$$

$$0.007998666667 \qquad (4.7)$$



We can also add in images

Exercise 5: In the space between the two rows of asterisks, insert a table and fill the boxes with interesting stuff.

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Save your work in a file that includes your name. Submit the saved file.