

WxMaxima Project I: Fall 2016

Before you answer the questions below go to and read:

- <http://www.scotchdress.com/wxmaxima/Introduction/Introduction.html>

wxMaxima is installed in the computer lab in the TMARC. You need to have it open and running before you attempt the next portion of the assignment. If you would like to install it on your own computer, you can find it here:

<https://sourceforge.net/projects/wxmaxima/?source=directory>

And if you would like to try out the App, you can find the maxima app for Android at:

<https://play.google.com/store/apps/details?id=jp.yhonda>

Instructions:

1. On your computing device, start wxMaxima, and then in a separate window, open and begin reading:
<http://www.scotchdress.com/wxmaxima/Arithmetic/Arithmetic.html>
2. While reading the tutorial on how to do arithmetic with the CAS, attempt to replicate the calculations in your open session of wxMaxima. Your equation numbers (the %o# tags) will be different! Simply adapt them to your session if necessary.
3. Once you have completed the reading, open a new session of wxMaxima and perform the following tasks:
 - (a) Create a title cell (Ctrl+2) and write: "Maxima Project I." End the cell by typing Shift+Enter
 - (b) Create a text cell (Ctrl+1) and write: By: <Insert Your Name>. Press Shift+Enter to create another text line and write: Date: <Today>. End the cell by typing Shift+Enter
 - (c) Create a section cell (Ctrl+3) and write: Arithmetic Practice.
 - (d) Use wxMaxima to calculate the following. Make sure to complete your input by typing Shift+Enter!
 - i. $17 - 34 \cdot 24$
 - ii. $\sqrt{275}$
 - iii. Using a semi-colon (;) repeat the last two calculations using a single line of input
 - iv. Using the %o# tag, find the cube of the value you calculated in (ii) above. Note that the result is: 125 [Space] $11^{3/2}$. Maxima uses a space to denote multiplication.

- v. Calculate: $7\left(2 - \frac{5}{3}\right) + 16^{3/2}$. Recall that Maxima cannot use parentheses alone for multiplication! You must use * for that.
- vi. Use a single quote (') to make Maxima show you a pretty version of: $(8 * \pi * \sqrt{3}) / 25$
- vii. Use float() to find a decimal approximation of e. Recall that you must type %e , and not just e.

(e) Create a section cell with the title: “Logarithm Practice”

- i. Try to calculate log(25) by simply typing in log(25) and hitting Shift+Enter
- ii. Now try: log(25.0) and then on a separate input: float(log(25))
- iii. Evaluate $\log(\sqrt{e})$. **Don't forget:** %e is required for e, and that the base of log is e!
- iv. Set the logexpand to “super” by entering as a command: logexpand:super;
- v. Expand the expression: $\log\left(\frac{ab^3}{\sqrt{wy^9}}\right)$
- vi. Use logcontract() and %o# to contract your last output.

(f) Create a section cell with the title “Factoring and Algebraic Expressions”

- i. Find: $(x+2)^8$ using expand()
- ii. Expand: $(2x+7)^2\left(\frac{1}{2}x-3\right)^4$. Don't forget to put multiplication between 2 and x: 2*x+7 and also between the individual factors!
- iii. Factor x^3-27 using factor()
- iv. Using ratsimp() combine:

$$\frac{1}{x^3+2x+1} - \frac{x^2}{x^4+1}$$
 - A. Factor the denominator of the result from (iv) by using denom() , factor(), and a %o# tag.
 - B. Check to see if the numerator from (iv) factors by using num(), factor(), an a %o# tag.

Save your work on a USB drive or on your home computer. Then print it by either: printing the file directly to a pdf and printing that, or exporting as html and then printing using Firefox/Chrome. Don't worry if specialized mathematics symbols do not display 100% correctly in your final printout, different printers, operating systems, and pdf rendering engines all have special requirements for these symbols, and it is not uncommon for the renderings to be “off” a little bit.