Getting Started.

1. Log in to your Sage Cloud account.
   (a) Start the Chrome browser.
   (b) Go to http://cloud.sagemath.com
   (c) Click “Sign In”.
   (d) You should see an existing Project for our class. Click on that.
   (e) Click “New”, call it c03, then click “Sage Worksheet”.

2. Use plot() to sketch one period of \( \cos x \).

   To sketch multiple plots on the same axis, use the “+” symbol between the plot commands.

3. Sketch \( x^2 \) and \( x^3 \) on the interval \((-2, 2)\).

4. Use Help on the plot() function to learn how to add color to a graph sketch (type and evaluate plot?).

5. Sketch \( x^2 \) and \( x^3 \) on the interval \((-2, 2)\). Make one graph red and the other graph green.

6. Evaluate \( f(x) = x^3 - x \). Find \( f(1) \), \( f(100) \). Try plot(f,-2,2) and plot(f(x),-2,2) and plot(f).

7. Evaluate \( c = \frac{27}{11} \). Find \( f(c) \).
8. Define a new variable “\(y\)” by evaluating \texttt{var(“y”)}. Now sketch \(g(x) = x^2 + y^2 - 2\) for \(-1 \leq x \leq 1\) and \(-1 \leq y \leq 1\) by evaluating \texttt{plot3d(x**2+y**2-2, (-1,1),(-1,1))}.

9. Solve \(x^2 - 1 = 0\) by evaluating \texttt{solve(x**2-1,x)}

10. Find all solutions of \(\sin \theta = \frac{1}{2}\) by hand. Now try \texttt{solve(sin(x)-.5,x)}. Explain Sage’s result.

11. Draw the graphs of the following equations by hand. Find the solutions by hand.
\[
\begin{align*}
  x^2 + y^2 &= 4 \\
  y &= x + 1
\end{align*}
\]
Now use \texttt{solve()} to find the intersection points of the graphs of this system of equations. First use the Help by typing \texttt{solve?}.

12. Sketch the graph of \(f(x) = x^5 + x^4 + x^3 - x^2 + x - 1\). Find the root (zero) of this function: \texttt{find_root(x^5 + x^4 + x^3 - x^2 + x - 1,-1,1)}. Now try \texttt{find_root(x^5 + x^4 + x^3 - x^2 + x - 1,-1,0)}. Explain the result.