

NAME :

1. A rational approximation for $\log(2)$ is $61/88$.
 - (a) What is the error of this rational approximation for $\log(2)$?
Give all relevant Sage commands you used to compute the error.
 - (b) If $61/88$ would not be accurate enough for $\log(2)$, what is the next more accurate rational approximation? Write this number.
Give all relevant Sage commands used to obtain this number.
2. Consider the polynomial $p = x^3 + 2x + 1$.
 - (a) Give all Sage commands to show that p does not factor when computing modulo 5. Computing modulo 5 is computing in a finite field of 5 elements.
 - (b) Write the Sage command to declare the algebraic number $\mathbf{a}$ as a root of p .
What is $\mathbf{a}^{12}$ over this extended number field?

Homework Assignment:

Bring to class on Monday the print out of the Sage notebook (or SageMath worksheet) with your answers to assignments 3, 4, 5 of Lecture 3; and assignments 3 and 4 of Lecture 4. Questions requiring an explanation must be answered with a couple of *complete* sentences.