

Math 255 - Spring 2022  
Continued fractions with a calculator  
15 points

This homework invites you to do some computations with continued fractions and convergents. You will want to use either a calculator or a computer to perform these computations. Sage has functions that compute continued fractions and convergents, and one can find Python functions that do the same thing online. You can also solve these problems by essentially doing them “by hand” but using a calculator. (You do not need to write down intermediate steps.) Please explain how you did the computations at least once on your homework.

1. Compute the continued fraction expansions for the following numbers.

(a)  $e$

(b)  $\sqrt{2}$

(c)  $\frac{1+\sqrt{5}}{2}$

2. Among the convergents of  $\sqrt{15}$ , find a rational number that approximates  $\sqrt{15}$  to four decimal places.