1. Calculate the number $\alpha$ whose continued fraction expansion is
   (a) $[1, 1, 4, 1, 1, 6, 1, 1, 8, ...]$.
   (b) $[4, 1, 1, 3]

2. The continued fraction expansion of $\pi$ starts as $[3, 7, 15, 1, 292, ...]$. Find an approximation via fractions which approximates $\pi$ within $10^{-4}$ and justify your answer.

3. Review the connection between continued fractions and solutions of Pell’s equation.