

Name: _____

Read and take notes on Section 19.5, Continued Fractions Sieve.

Reading Questions

1. What part of Dixon's Algorithm is optimized/improved in this section?

2. Find a series of rational approximations for $\sqrt{2}$ using continued fractions, as follows:
 - (a) Let $x_0 = \sqrt{2}$. Find $a_0 = \text{floor}(x_0)$. Then $r_0 = a_0$.
 - (b) Find $x_1 = \frac{1}{x_0 - a_0}$ and $a_1 = \text{floor}(x_1)$.
 - (c) Find $r_1 = \frac{p_1}{q_1} = a_0 + \frac{1}{a_1}$.
 - (d) Find $x_2 = \frac{1}{x_1 - a_1}$ and $a_2 = \text{floor}(x_2)$.
 - (e) Find $r_2 = \frac{p_2}{q_2} = a_0 + \frac{1}{a_1 + \frac{1}{a_2}}$.
 - (f) Find $x_3 = \frac{1}{x_2 - a_2}$ and $a_3 = \text{floor}(x_3)$.
 - (g) Find $r_3 = \frac{p_3}{q_3} = a_0 + \frac{1}{a_1 + \frac{1}{a_2 + \frac{1}{a_3}}}$.

3. What struck you in this reading? What is still unclear? What remaining questions do you have?