Some unique mathematical conjectures of continued fractions

Author- Satyam Roy
West Bengal, India

1st conjecture

$$\frac{6}{\pi}=3-\cfrac{9}{12-\cfrac{54}{21-\cfrac{135}{30-\cfrac{252}{39-\cfrac{405}{\dots}}}}}$$

The generalization of term is as follows-

$a(n) = 9 \times (n) + 3 \quad and \quad b(n) = -18 \times n + 9\times (n)$

We can also define $\Gamma(\frac{1}{2})^{2}=\pi$ therefore the continued fraction will become-

$$\frac{6}{\Gamma(\frac{1}{2})^{2}}=3-\cfrac{9}{12-\cfrac{54}{21-\cfrac{135}{30-\cfrac{252}{39-\cfrac{405}{\dots}}}}}$$

2nd conjecture

$$\frac{sin(\frac{\pi}{2})}{sin^{-1}(1)-sin(\frac{\pi}{2})}=2-\cfrac{3}{5-\cfrac{6}{8-\cfrac{15}{11-\cfrac{30}{14-\cfrac{49}{\dots}}}}}$$

The generalization of term is as follows-

$a(n) = 3n + 2 \; and \; b(n) = -2n^{2}+n$

3rd conjecture

I have designed this interesting conjecture, that includes napier's constant e and Ramanujan's number 1729, followed by an interesting continued fraction.

$$-\frac{1}{e} = -\frac{1729}{\sum_{n=0}^{n=\infty} \frac{(n-1+1729)}{n!}} = \frac{-3}{8+\frac{5}{32+\frac{21}{72+\frac{45}{128+\frac{77}{\cdots}}}}}$$

The generalization of term is as follows-

$$a(n) = 8n^2 \; and \; b(n) = 4n^2 - 4n - 3$$

THANK YOU