

1046-11-418

Keith R. Matthews and **John P. Robertson*** (JPR2718@AOL.COM), 600 Gardenia Ter, Delray Beach, FL 33444, and **Jim White**. *Nearest Square Continued Fractions, and Related Results.*

We present

- (a) A theorem that for any quadratic irrational, the lengths of the periods of the nearest square continued fraction (NSCF) and the nearest integer continued fraction (NICF) are the same,
- (b) Three criteria for recognizing the midpoint of the NSCF of \sqrt{D} without computing the whole period, and
- (c) A simple characterization of quadratic irrationals that have purely periodic NICFs.

The NSCF is derived from the cyclic method of Bhaskara as developed by A. A. Krishnaswami Ayyangar.

To prove the equality of the period lengths we study the singularization process whereby segments of the regular continued fraction with partial quotients of 1 are transformed into shorter segments in the NSCF and NICF. We also look at how well the convergents approximate the quadratic irrational to study some of the more subtle aspects of the singularization process for the NSCF. (Received September 01, 2008)