Continued fraction

A *continued fraction* is a fraction of the form

$$a_1 + \cfrac{b_1}{a_2 + \cfrac{b_2}{a_3 + \cfrac{b_3}{a_4 + \cdots}}}$$

A *simple* continued fraction is one in which every b_i is equal to 1, and every a_i is a positive integer (except that a_1 may be any integer).

Every rational number can be written as a terminating simple continued fraction.

Some numbers can be written as recurring simple continued fractions, for example

$$\sqrt{5} = 2 + \cfrac{1}{4 + \cfrac{1}{4 + \cfrac{1}{4 + \cdots}}}$$

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