Big Fractions

For more about continued fractions, see Wikipedia or the Continued Fraction Calculator.

Calculate a continued fraction for each of the following:

$$\frac{5}{6}$$

$$\frac{41}{19}$$

$$\frac{41}{50}$$

$$\frac{50}{41}$$

$$\frac{172}{111}$$

Switch it up! Try converting these continued fractions to a simple fractions.

$$1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{3}}}$$

$$1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4}}}}}}$$

Now, try computing the value of an infinite continued fraction:

$$1$$

$$1+\frac{1}{1}$$

$$1+\frac{1}{1+\frac{1}{1}}$$

$$1+\frac{1}{1+\frac{1}{1+\frac{1}{1}}}$$

$$1+\frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{1}}}}$$

$$1+\frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{1}}}}}$$

$$1+\frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{1}}}}}}$$

...

What is the value of the infinite continued fraction? Can you prove it?

Use a calculator to compute the first few terms in the continued fraction for π

A Few Other Continued Fractions

Can you guess the value of these infinite continued fractions?

$$1+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{2+\cfrac{1}{\cdots}}}}}}$$

$$2+\cfrac{1}{1+\cfrac{1}{2+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{4+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{6+\cfrac{1}{\cdots}}}}}}}}}$$

$$\cfrac{4}{1+\cfrac{1}{2+\cfrac{9}{2+\cfrac{25}{2+\cfrac{49}{2+\cfrac{81}{2+\cfrac{121}{\cdots}}}}}}}$$