Subject: Re: Calculating Pi
Posted by Jean H. on Sun, 01 Apr 2007 18:22:52 GMT
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Hi,

interesting question indeed....
My friend google found the following.
The first method is easy to implement, does not require paper, scissors
nor kids throwing rocks ....

Jean

http://www.faqs.org/faqs/sci-math-faq/specialnumbers/compute Pi/
Newsgroups: sci.math
From: alopez-o@neumann.uwaterloo.ca (Alex Lopez-Ortiz)
Subject: sci.math FAQ: How to compute Pi?
Summary: Part 12 of many, New version,
Message-ID: <DhahaI76KE.HAv@undergrad.math.uwaterloo.ca>
Sender: news@undergrad.math.uwaterloo.ca (news spool owner)
Date: Fri, 17 Nov 1995 17:14:38 GMT
Reply-To: sci.math@news.news.demon.net

Archive-Name: sci-math-faq/specialnumbers/computePi
Last-modified: December 8, 1994
Version: 6.2

How to compute digits of pi ?

Symbolic Computation software such as Maple or Mathematica can compute 10,000 digits of pi in a blink, and another 20,000-1,000,000 digits overnight (range depends on hardware platform).

It is possible to retrieve 1.25+ million digits of pi via anonymous ftp from the site wuarchive.wustl.edu, in the files pi.doc.Z and pi.dat.Z which reside in subdirectory doc/misc/pi. New York's Chudnovsky brothers have computed 2 billion digits of pi on a homebrew computer.

There are essentially 3 different methods to calculate pi to many decimals.

1. One of the oldest is to use the power series expansion of atan(x)

= x - x^3/3 + x^5/5 - ... together with formulas like pi = 16*atan(1/5) - 4*atan(1/239) . This gives about 1.4 decimals per term.

2. A second is to use formulas coming from Arithmetic-Geometric mean computations. A beautiful compendium of such formulas is given in the book pi and the AGM, (see references). They have the advantage of converging quadratically, i.e. you double the number of decimals per iteration. For instance, to obtain 1 000 000 decimals, around 20 iterations are sufficient. The disadvantage is that you need FFT type multiplication to get a reasonable speed, and this is not so easy to program.

3. The third, and perhaps the most elegant in its simplicity, arises from the construction of a large circle with known radius. The length of the circumference is then divided by twice the radius and pi is evaluated to the required accuracy. The most ambitious use of this method was successfully completed in 1993, when H. G. Smythe produced 1.6 million decimals using high-precision measuring equipment and a circle with a radius of a staggering nine hundred and fifty miles.

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