

Re: question regarding diofantine equations

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- *From:* Gerry Myerson <gerry@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>
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In article <20070410.142106@xxxxxxxx>, rob@xxxxxxxxxxxxxxxx (Rob Johnson) wrote:

In article <1176237012.557078.287790@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>, "laura" <laura.brandusan@xxxxxxxx> wrote:

I want to solve diofantine equations of form:

$$ax+by=c,$$

where a, b and c are real numbers and

x and y are natural numbers (≥ 0).

Are there any methods for solving this ? I don't want to enumerate all possible pairs (x,y) and to check which ones are good.

Or, is there possible to decide if the equation has solutions without solving it?

The algorithm is called the extended euclidean algorithm, and one implementation is the Euclid-Wallis Algorithm:

<<http://www.whim.org/nebula/math/euclid-wallis.html>>

OP wants a, b, and c to be real numbers. If $b = 1$ and $c = 0$ then the question of whether $ax + by = c$ has solutions is the question of whether a is rational. It's going to take a heck of an extension of Euclid's algorithm to decide whether, say, gamma is rational.

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Gerry Myerson (gerry@xxxxxxxxxxxxxxxxxxxx) (i -> u for email)