Distribution of the Gaussian primes

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Modular Arithmetic

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- First notation that made working with divisibility relationships easier, and less awkward, which in turn, helped accelerate number theory.

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Let m be a positive integer. If a and b are integers, we say that a is *congruent to b modulo m* if $m \mid (a-b)$.

That is, $a \equiv b \pmod{m}$ if $m \mid (a-b)$.

However, $a \not\equiv b \pmod{m}$ if $m \nmid (a-b)$. [R]

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Example

$11 \equiv 3 \pmod{4}$ since $4 \mid (11-3) = 8$.

$3 \equiv -6 \pmod{9}$ since $9 \mid (3-(-6)) = 9$.

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