Analysis of the trinomial f(n) = $n^2 + n + 17$.

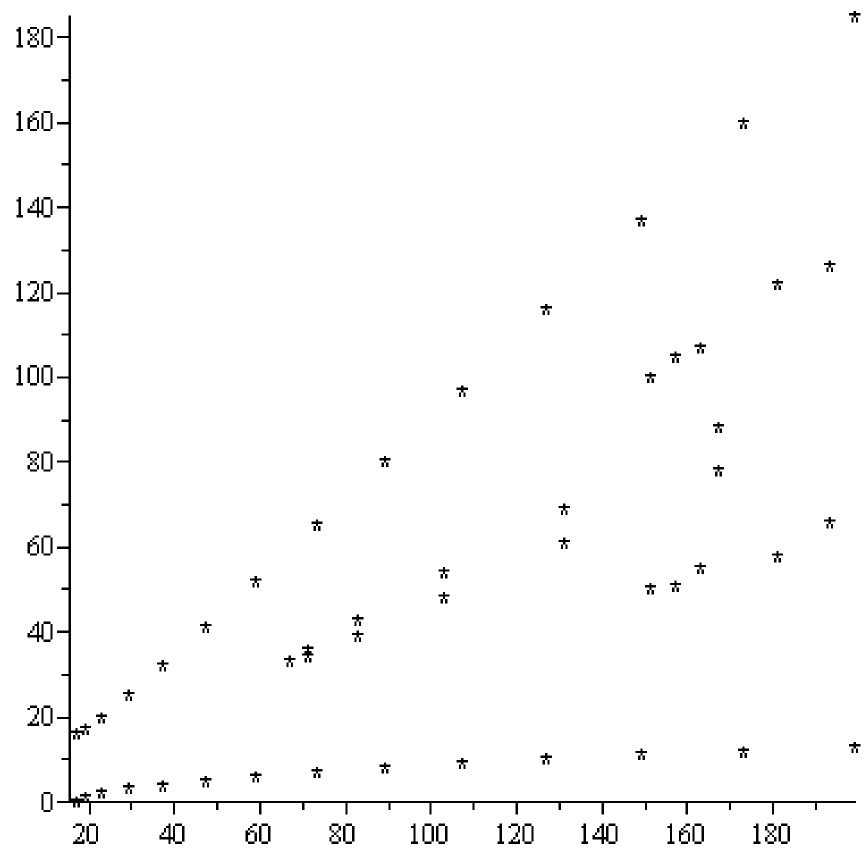
Abstract – Assuming that n is an non-negative integer, we find a pattern of when f(n) = $n^2 + n + 17$ is a composite number. We assign n as n = $A*x^2+B*x+C$. Where A, B, and C are determined by numerical evidence. The f(n) factors algebraically, and f(n) is a composite number.

We use the Maple program to calculate the values of 'n' where f(n) is a composite number. Then we graph these results. The graph shows some structure for the composite cases. See Maple code.

```
> # 6 −29 −2023
>
  x := Vector[row](49) :
  y := Vector[row](49) :
  counter := 1 :
  for a from 2 to 200 do
  for b from 0 to a − 1 do
  if mod(b^2 + b + 17, a) = 0
    then x[counter] := a : y[counter] := b : counter := counter + 1;
  end if;
  end do:
  end do:

> counter

> plot(x, y, style = point, symbol = asterisk, color = black )
```



> *# this is a graph of 49 data points of* $y^2 + y + 17 \ \mathbf{mod}\ x = 0$.

> *# It can be curve fit with parabolas.*

> *# This graph shows 5 parabolas*

> *# The names of the parabolas are* p_{top}; p_{bottom}; $p_{2,1}$; $p_{3,2}$; **and** $p_{3,1}$

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Hope you find this page interesting.