

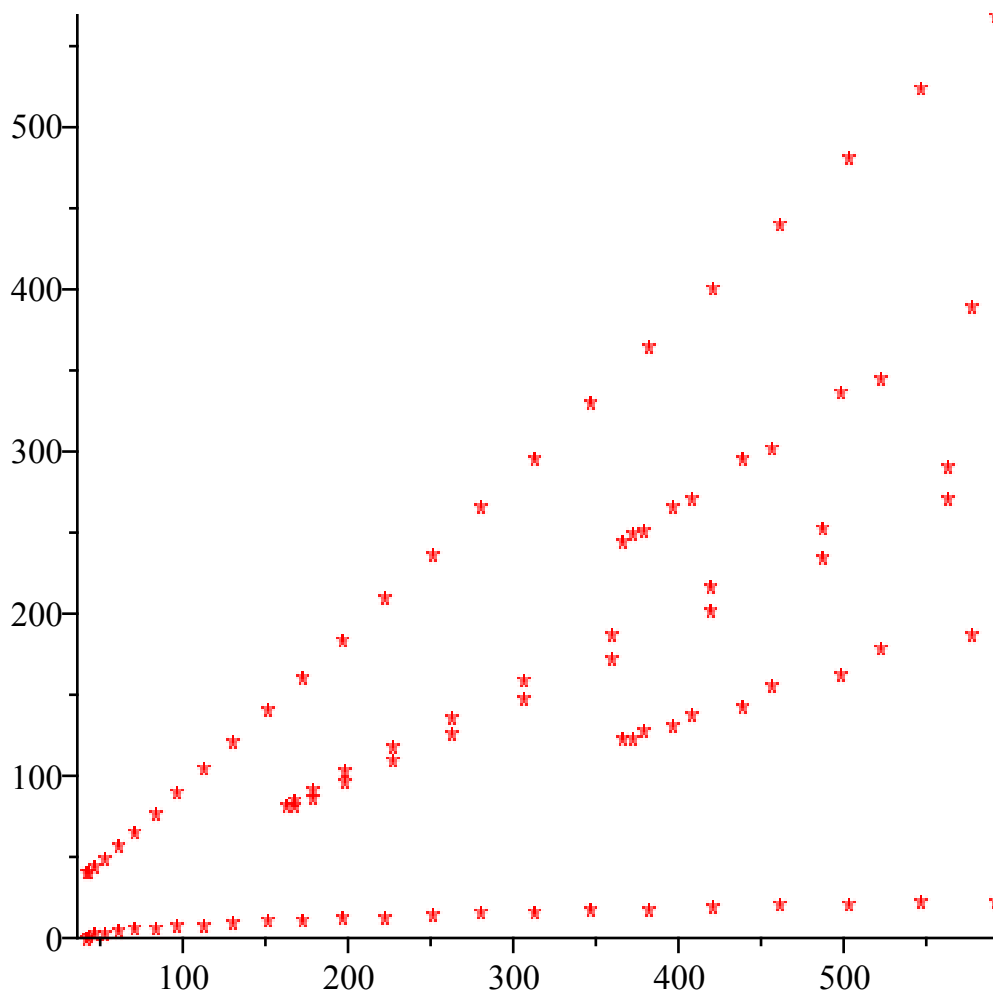
```

[> # trinomials from divisibility graph for  $n^2 + n + 41$ 
[>
[>  $x[1, 1, bottom] := z^2 + z + 41 :$ 
[>  $y[1, 1] := z :$ 
[>  $p2 := plot([x[1, 1, bottom], y[1, 1], z=0..20]) :$ 
[>  $with(plots) :$ 
[>  $display(p2) :$ 
[>
[>  $x[1, 1, top] := z^2 + z + 41 :$ 
[>  $y[1, 1, top] := z^2 + 40 :$ 
[>  $p3 := plot([x[1, 1, top], y[1, 1, top], z=0..20]) :$ 
[>  $display(p3) :$ 
[> # this is correct
[>
[>  $y[2, 1] := 2z^2 + z + 81 :$ 
[>  $x[2, 1] := 4z^2 + 163 :$ 
[>  $p4 := plot([x[2, 1], y[2, 1], z=-10..10]) :$ 
[>  $display(p4) :$ 
[>
[>  $y[3, 1] := 3z^2 + 2z + 122 :$ 
[>  $x[3, 1] := 9z^2 + 3z + 367 :$ 
[>  $p5 := plot([x[3, 1], y[3, 1], z=-4..3]) :$ 
[>
[>  $y[3, 2] := 6z^2 + z + 244 :$ 
[>  $x[3, 2] := 9z^2 + 3z + 367 :$ 
[>  $p6 := plot([x[3, 2], y[3, 2], z=-4..3]) :$ 
[>

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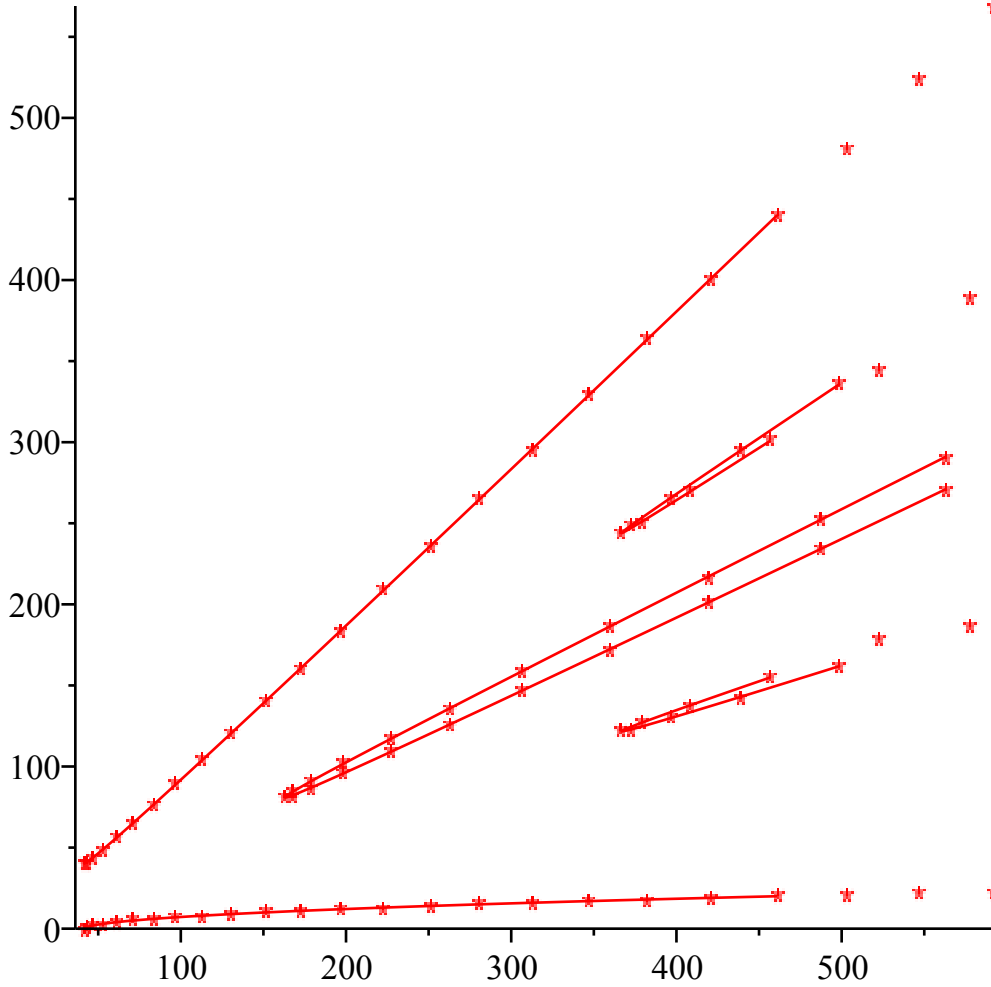
(1)

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>
> d1 := display([p2, p3, p4, p5, p6])
                                d1 := PLOT(...)
# d1 is 5 parabolas.
#Matt C. Anderson
#9-17-2015
> xv := Vector[row](89) :
yv := Vector[row](89) :
counter := 1 :
for a from 2 to 600 do
for b from 0 to a - 1 do
if mod(b2 + b + 41, a) = 0 then xv[counter] := a : yv[counter] := b : counter := counter
+ 1; end if;
end do;
end do;
> counter :
> d2 := plot(xv, yv, style = point, symbol = asterisk) :
> plot(xv, yv, style = point, symbol = asterisk)
```



```
> # graph of divisors for n2 + n + 41.
```

> *display(d1, d2)*

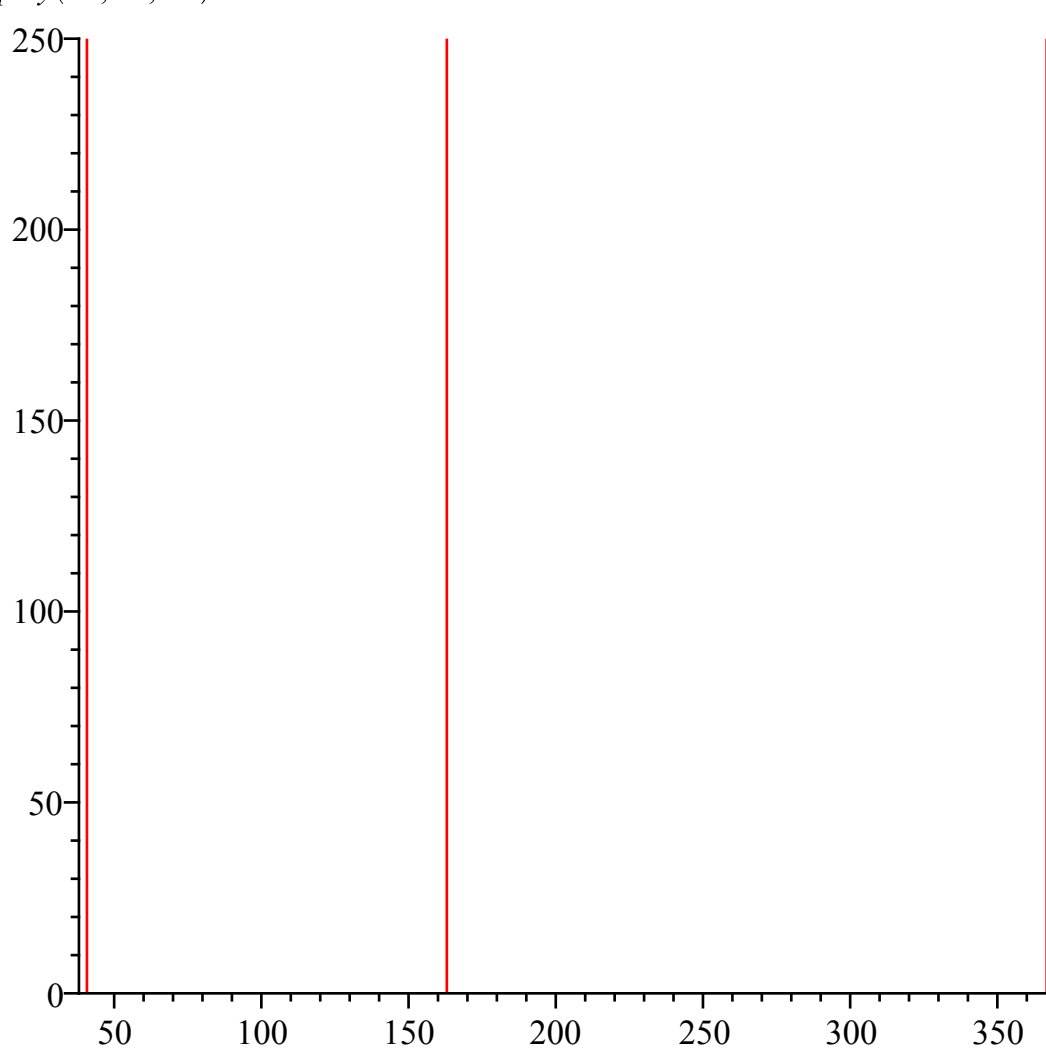


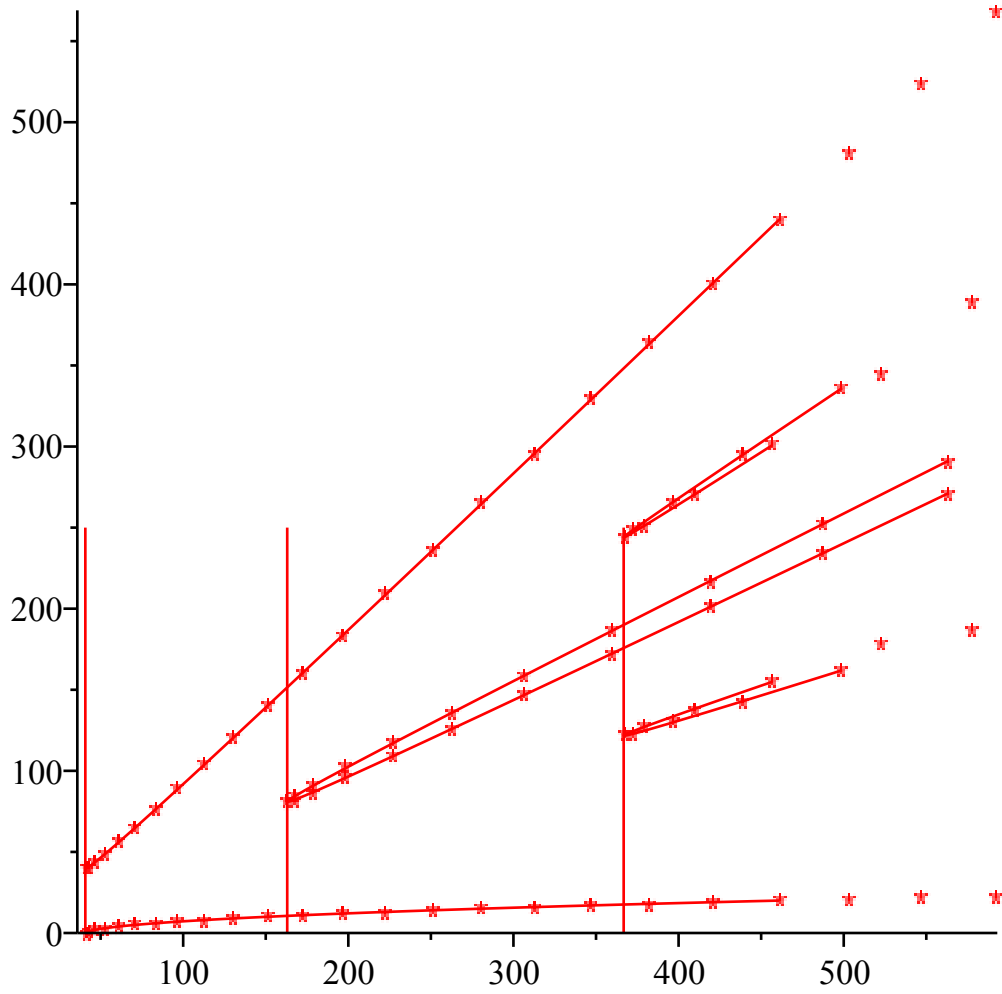
> "Notice the exact curve fit of parabolas to divisibility points"

"Notice the exact curve fit of parabolas to divisibility points"

(2)

```
>
> x1 :=  $\frac{163}{4}$ 
                                      $x1 := \frac{163}{4}$  (3)
> x2 :=  $\frac{163 \cdot 2^2}{4}$ 
                                      $x2 := 163$  (4)
> x3 :=  $\frac{163 \cdot 3^2}{4}$ 
                                      $x3 := \frac{1467}{4}$  (5)
> # plots[display](plottools[line]([x1, 0], [x1, 50]), color = red);
> d3 := plots[display](plottools[line]([x1, 0], [x1, 250]), color = red) :
> d4 := plots[display](plottools[line]([x2, 0], [x2, 250]), color = red) :
> d5 := plots[display](plottools[line]([x3, 0], [x3, 250]), color = red) :
> display(d3, d4, d5)
> display(d1, d2, d3, d4, d5)
```





> "notice the vertical lines are tangent to the parabolas."

"notice the vertical lines are tangent to the parabolas."

(6)