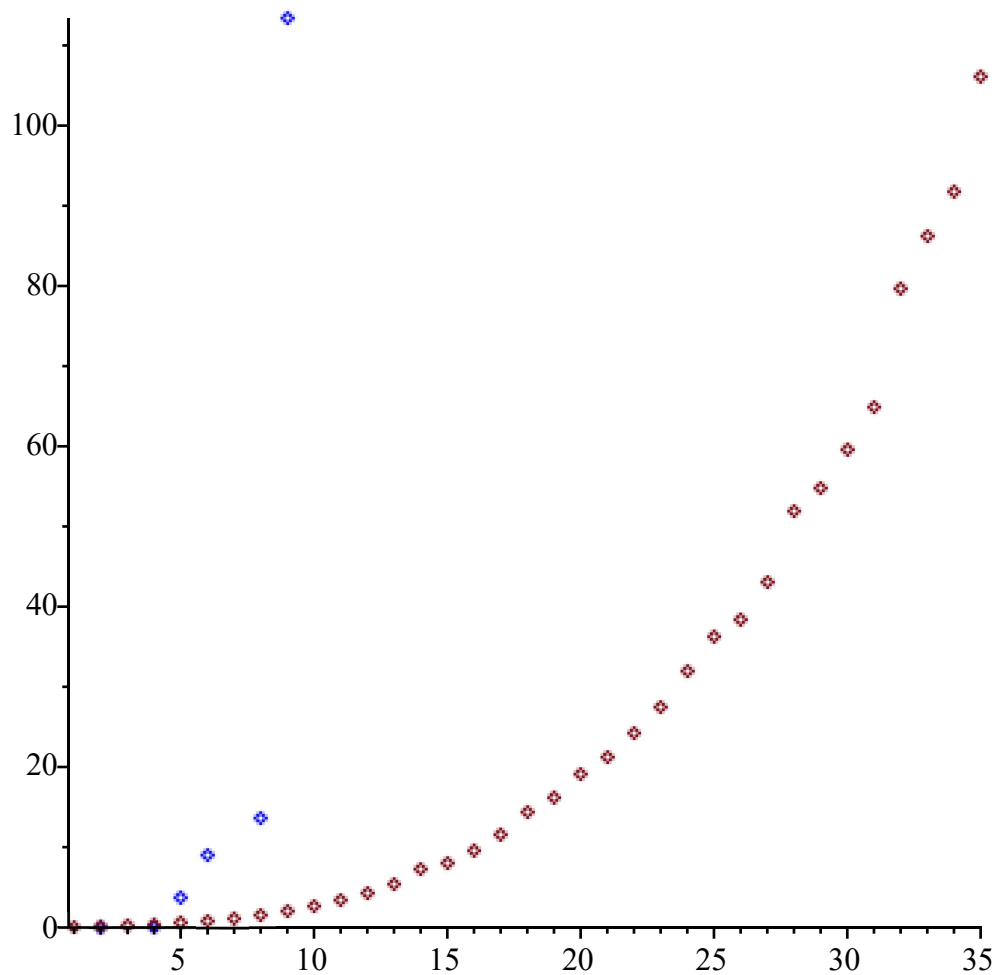


[> *restart;*

## ▼ How long does this take? Maple vs Julia

```
[>
> timeminimize := [[1.0, 0.050890266], [2.0, 0.11834318], [3.0, 0.227840882], [4.0,
0.347862787], [5.0, 0.578336777], [6.0, 0.843815187], [7.0, 1.113742127], [8.0,
1.521351197], [9.0, 2.05085871], [10.0, 2.672097046], [11.0, 3.400437168], [12.0,
4.29409003], [13.0, 5.37493734], [14.0, 7.267861195], [15.0, 7.997643094], [16.0,
9.59350568], [17.0, 11.579650133], [18.0, 14.388007227], [19.0, 16.17882418], [20.0,
19.13261061], [21.0, 21.2199024], [22.0, 24.243968881], [23.0, 27.458971985], [24.0,
32.012131231], [25.0, 36.284729702], [26.0, 38.40136662], [27.0, 43.055821853],
[28.0, 51.938189073], [29.0, 54.790807028], [30.0, 59.606144933], [31.0,
64.897676784], [32.0, 79.697467594], [33.0, 86.264206636], [34.0, 91.790034284],
[35.0, 106.138792051]] :
> plotmaple := plot([ [2, 0.], [4, 0], [5, 3.718], [6, 9.046], [8, 13.640], [9, 113.421] ], style
= point, color = blue) :
> plotmin := plot(timeminimize, style = point) :
> plotulam := plot(timeulam, style = point) :
> with(plots) : with(Statistics) :
> display(plotmaple, plotmin)
```

(1.1)



```
> A := PowerFit([seq(timeminimize[i][1], i = 10..35)], [seq(timeminimize[i][2], i = 10..35)]); #starting at 10 makes this look better
```

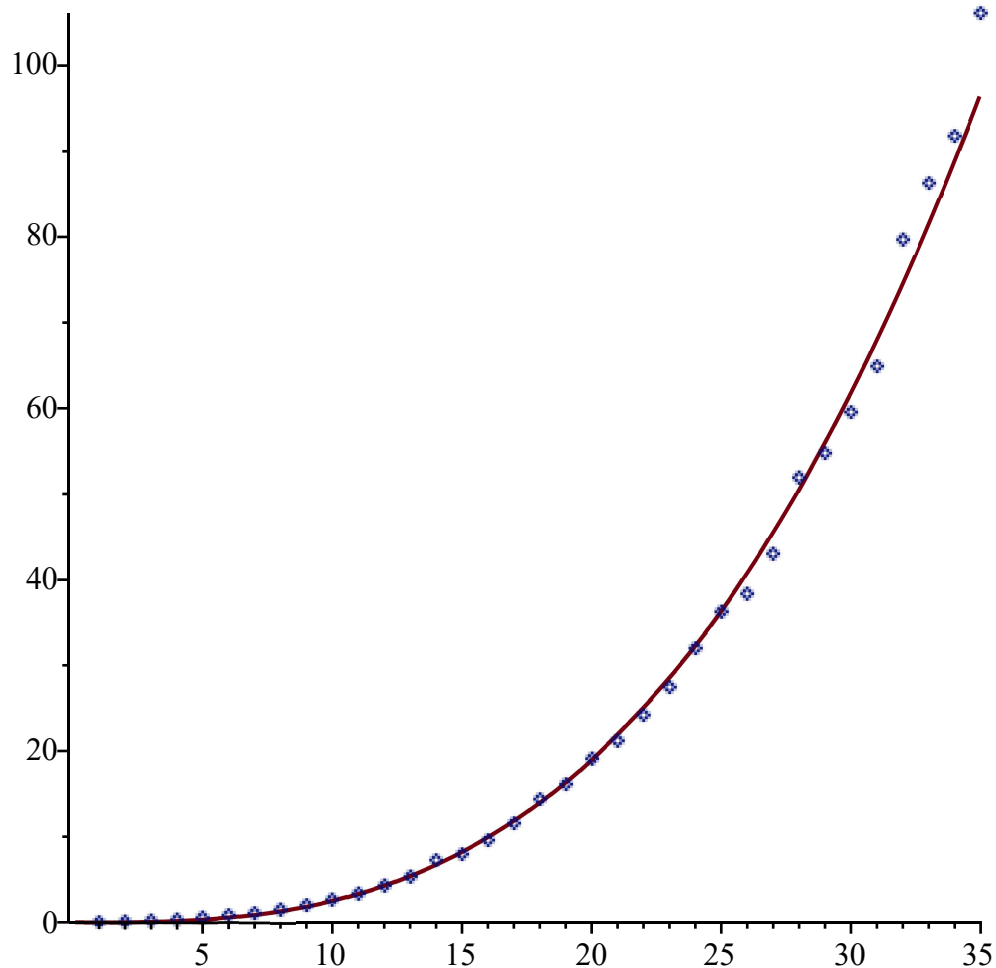
$$A := \begin{bmatrix} 0.00313865711957084 \\ 2.90720371287480 \end{bmatrix}$$

(1.2)

```
> g := x → A[1] · xA[2] :
```

```
> pg := plot(g) :
```

```
> display(pg, plotmin)
```



## Approximating alpha when u=3, 500 vs 1000

>

```
#We import the data points obtained with julia of the values of alpha for u=3 and v=1,2
mod 4
modulo3withlown := [[4.0, 2.2090585632674156],
[5.0, 2.004898426059939],
[7.0, 2.1653740786084636],
[8.0, 2.0338219432998845],
[10.0, 2.143731308811677],
[11.0, 2.049181328316959],
[13.0, 2.1339571547099023],
[14.0, 2.058556537353355],
[16.0, 2.1258785171359866],
[17.0, 2.0633438781378977],
[19.0, 2.1222880115475795],
[20.0, 2.0689291090531974],
[22.0, 2.1176004070293817],
[23.0, 2.0709238343800904],
[25.0, 2.116104363034212],
```

[26.0, 2.074614076234842 ],  
[28.0, 2.112813066244839 ],  
[29.0, 2.075411966365599 ],  
[31.0, 2.1122146486467708 ],  
[32.0, 2.0783043180895935 ],  
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[40.0, 2.1073275715958837 ],  
[41.0, 2.080697988481865 ],  
[43.0, 2.107527044128573 ],  
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[47.0, 2.082393505009724 ],  
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[50.0, 2.083989285271238 ],  
[52.0, 2.104435219871889 ],  
[53.0, 2.083690076472204 ],  
[55.0, 2.104734428670923 ],  
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[62.0, 2.0859840105981307 ],  
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*modulo3* := [ [4.0, 2.2090585632674156],

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[8.0, 2.0338219432998845 ],  
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[13.0, 2.1339571547099023 ],  
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[17.0, 2.0633438781378977 ],  
[19.0, 2.1222880115475795 ],  
[20.0, 2.0689291090531974 ],  
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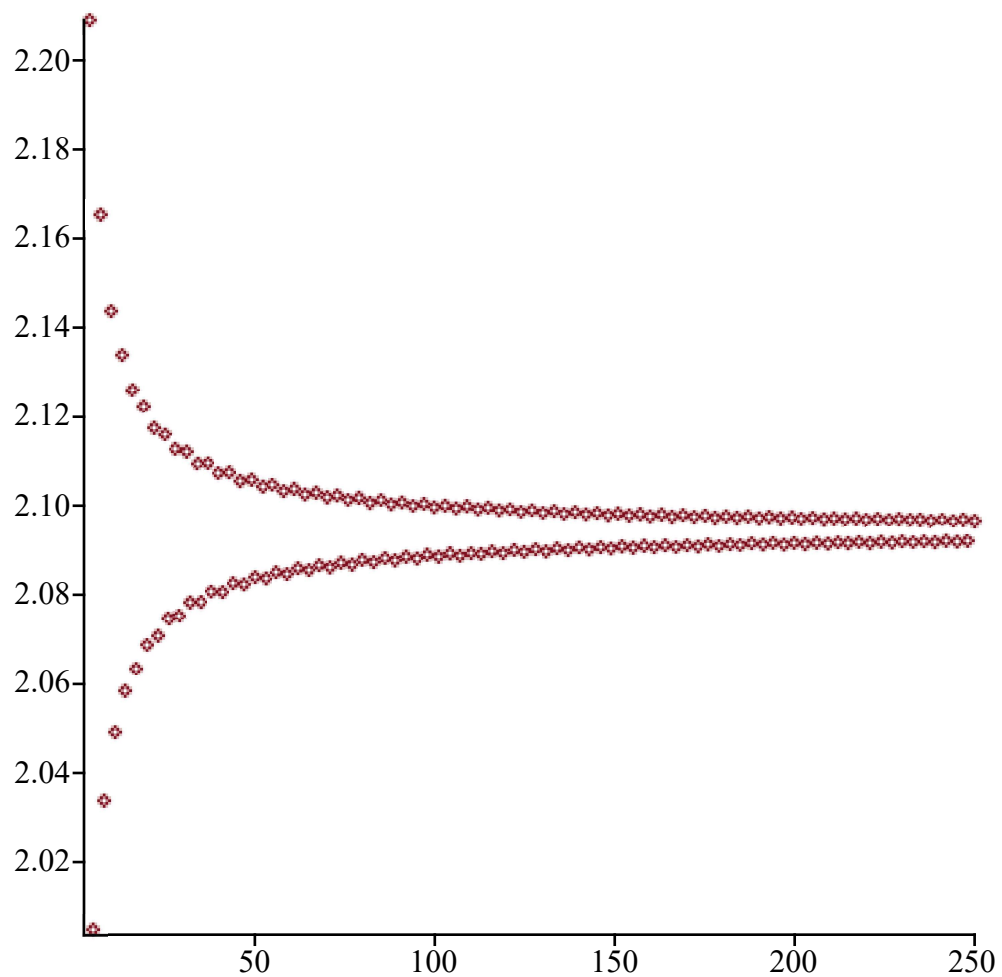
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[199.0, 2.09735394496142 ],
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```

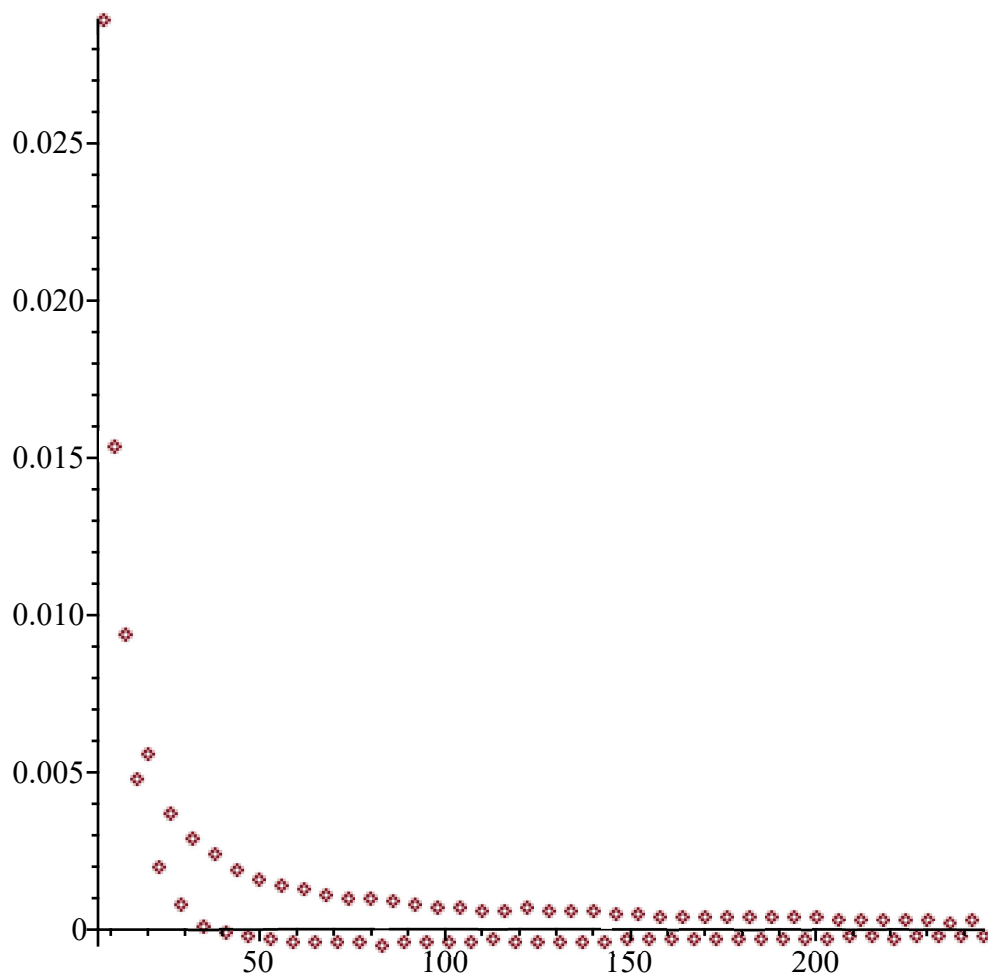
*p1* := *plot(modulo3, style = point)*



```

> S := [seq([modulo3[2·n + 2][1], modulo3[2·n + 2][2] - modulo3[2·n][2]], n = 1
    ..floor( $\frac{nops(modulo3)}{2} - 2$ ))]:
S2 := [seq([modulo3withlown[2·n + 2][1], modulo3withlown[2·n + 2][2]
    - modulo3withlown[2·n][2]], n = 1 ..floor( $\frac{nops(modulo3withlown)}{2} - 2$ ))]:
half := [seq([modulo3[2·n][1], modulo3[2·n][2]], n = 1 .. $\frac{nops(modulo3)}{2}$ )]:
> plot(S, style = point)

```

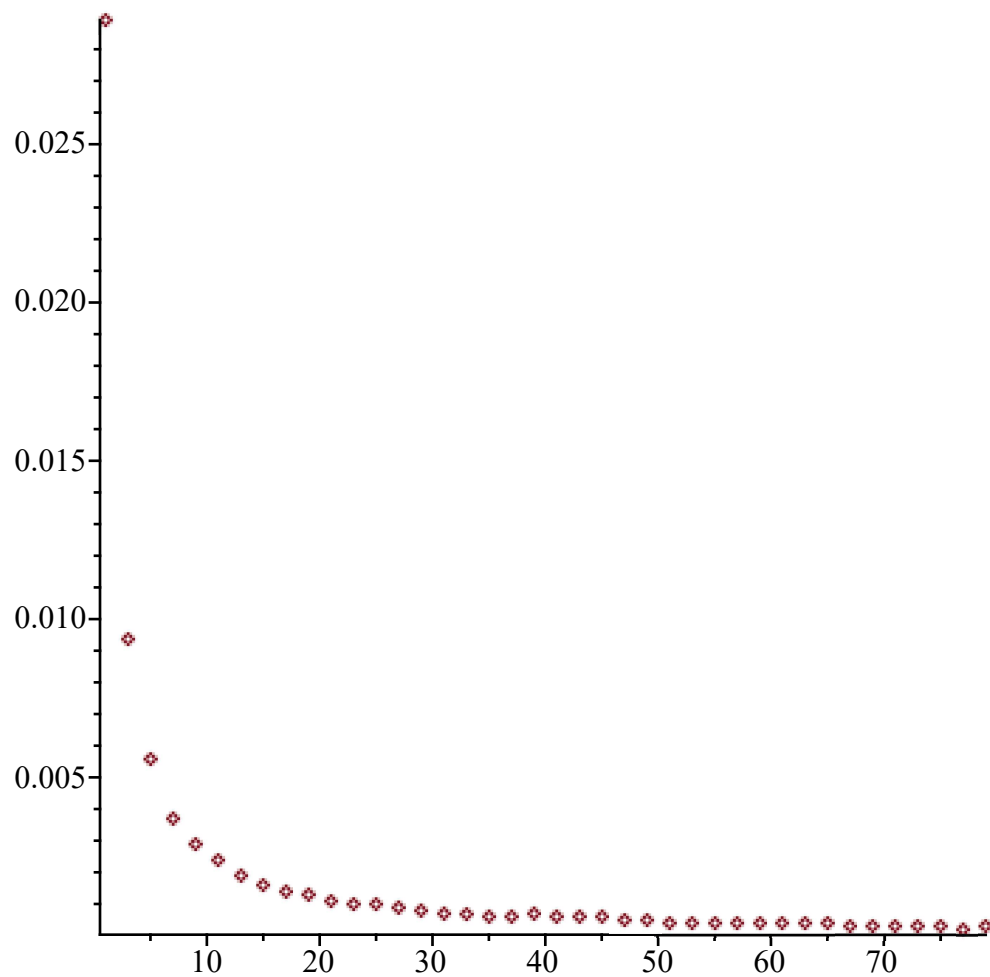


> #we see that these points form two different curves so we focus only on the one on top

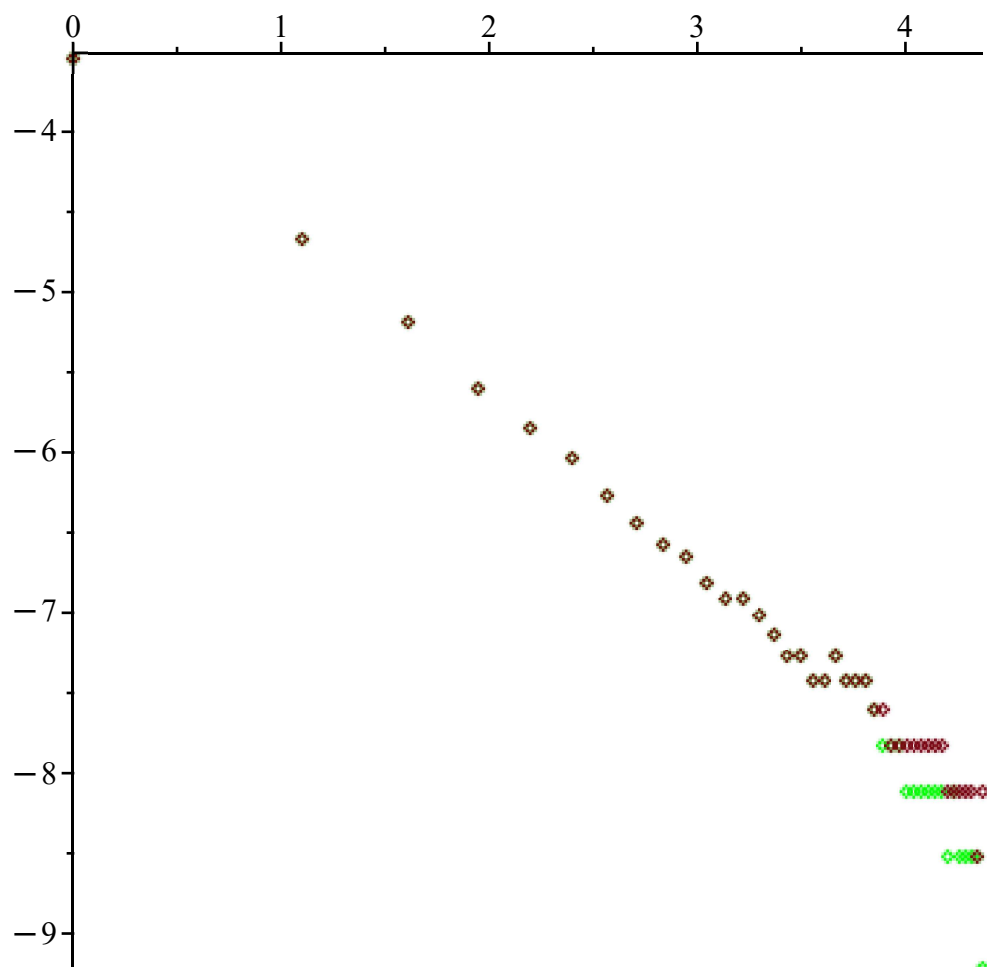
>  $W := \left[ seq \left( [2 \cdot n + 1, S[2 \cdot n + 1][2]], n = 0 .. \frac{nops(S)}{2} - 1 \right) \right] :$   
 $W2 := \left[ seq \left( [2 \cdot n + 1, S2[2 \cdot n + 1][2]], n = 0 .. \frac{nops(S2)}{2} - 1 \right) \right] :$

> #we plot the difference of half of half of the points in the original plot in log mode, which gives a sort of straight line

>  $plotw := plot(W, style = point);$   
 $plotw2 := plot(W2, style = point, color = green) :$



```
> with(plots) :
logw := [seq([ln(W[n][1]), ln(W[n][2])], n = 1 ..nops(W))]:
logw2 := [seq([ln(W2[n][1]), ln(W2[n][2])], n = 1 ..nops(W2))]:
plotlogw := plot(logw, style=point):
plotlogw2 := plot(logw2, style=point, color=green):
display(plotlogw2, plotlogw)
```



```
> with(Statistics) :
```

```
>
```

```
> fit1 := Fit(a·x + b, logw, x);  
fit2 := Fit(a·x + b, logw2, x);
```

$$fit1 := -1.07186930938300 x - 3.50397786770138$$

$$fit2 := -1.17627993139665 x - 3.26669911718251$$

(2.1)

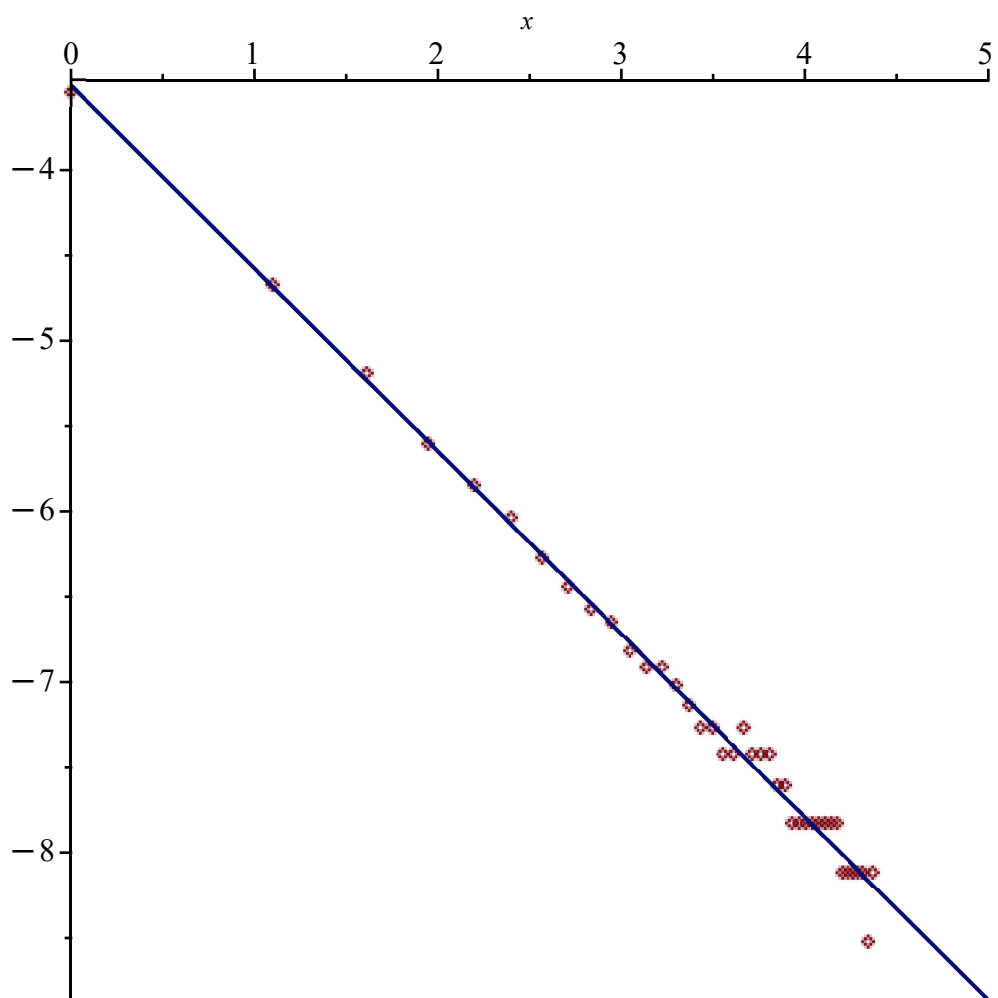
```
> h := x→fit1;  
h2 := x→fit2
```

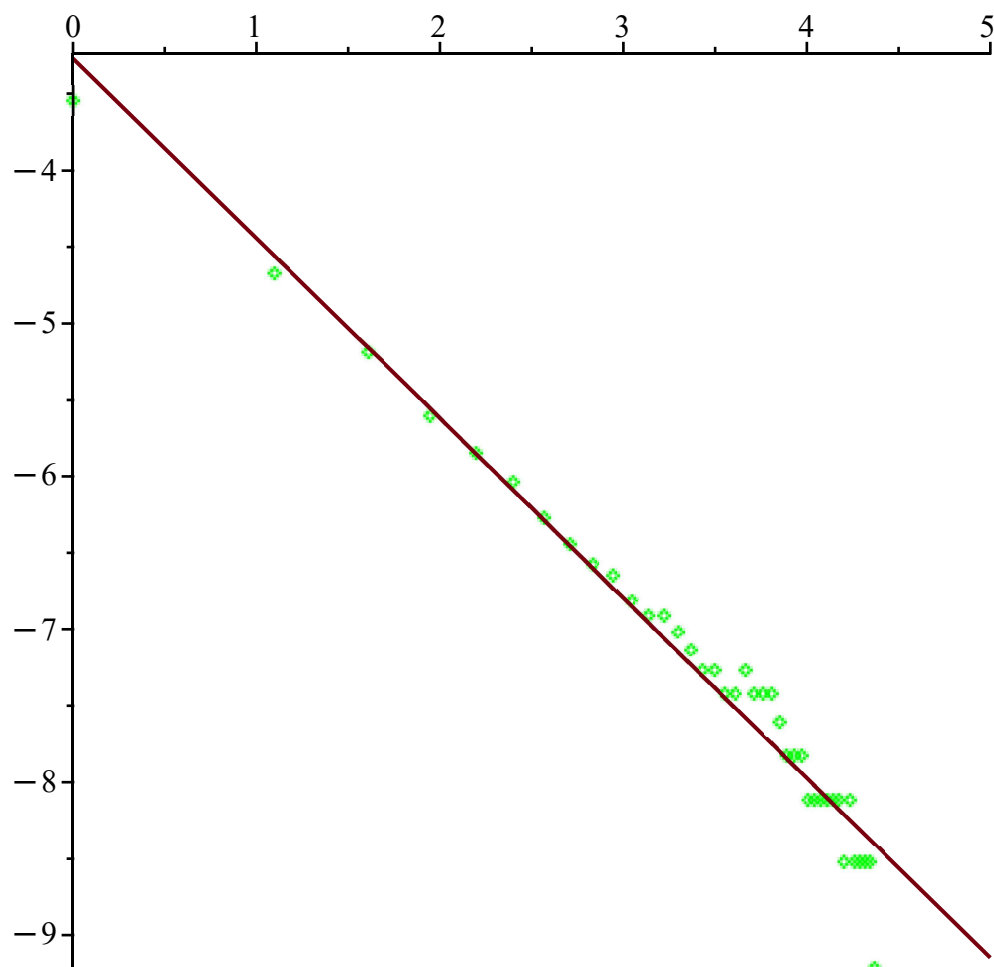
$$h := x \mapsto fit1$$

$$h2 := x \mapsto fit2$$

(2.2)

```
> ploth := plot(h(x), x=0..5) :  
ploth2 := plot(h2(x), x=0..5) :  
> display(plotlogw, ploth);  
display(plotlogw2, ploth2);
```

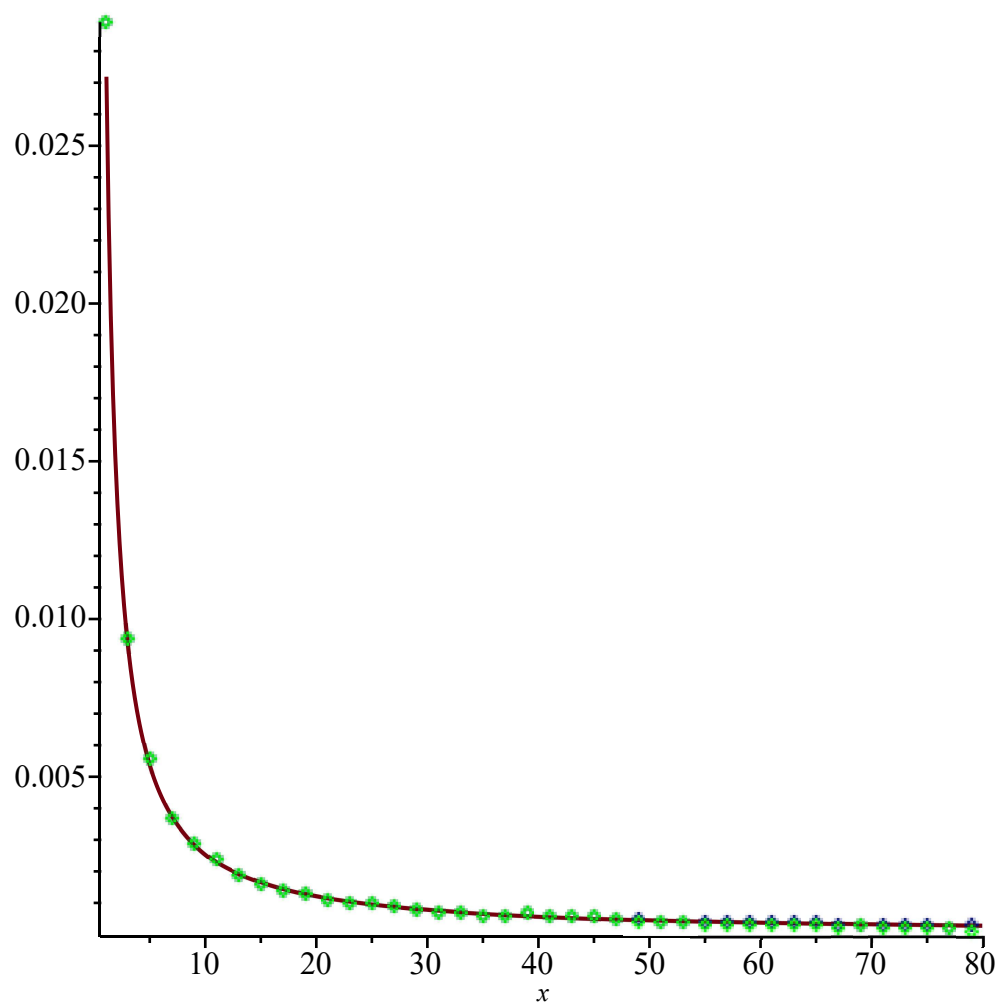




```
> g := x→exp( -1.07186930938300 ln(x) - 3.50397786770138 )
      g := x ↦ e-1.07186930938300·ln(x) - 3.50397786770138
```

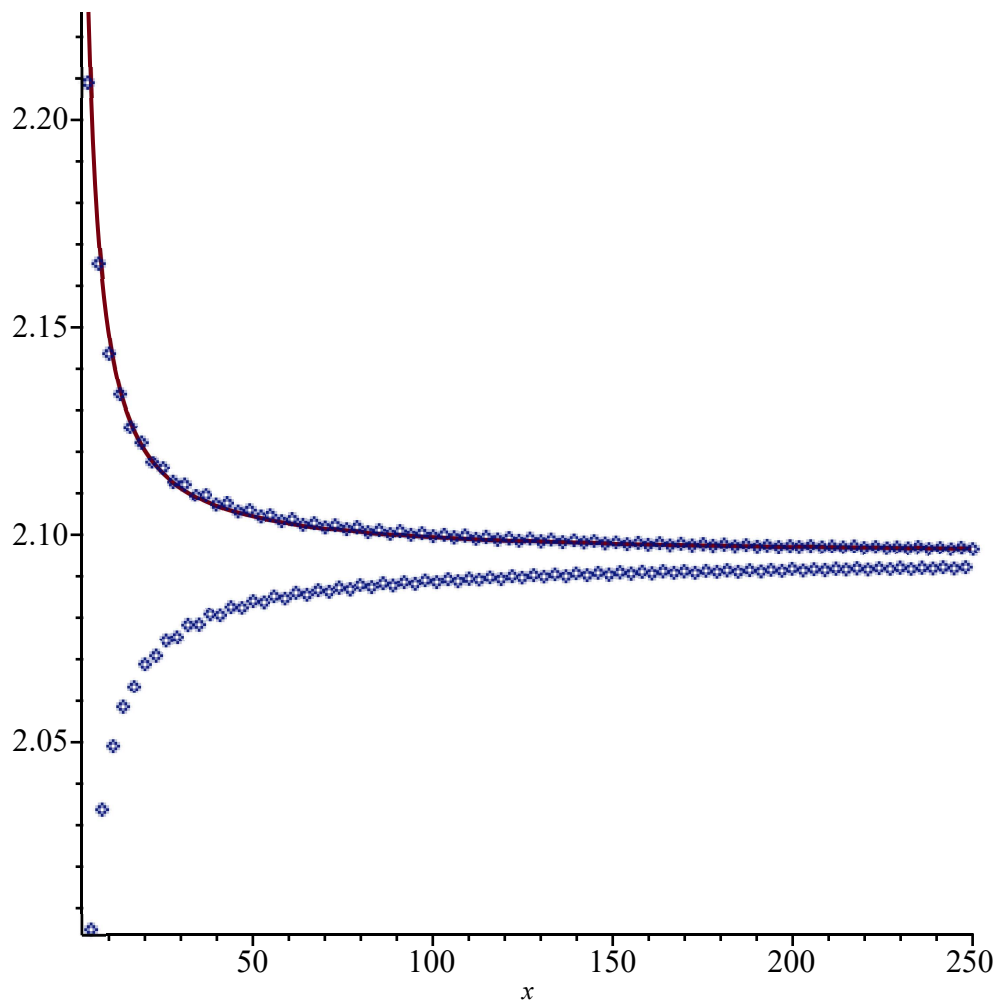
(2.3)

```
> plotg := plot(g(x), x=1 ..80) :
  display(plotg, plotw, plotw2)
```



```
> plotg2 := plot(g(x/17) + 2.095, x=4..250) :
display(plotg2, p1)
```





> *##this approximation starts being pretty good but not so good for larger v, probably because we require larger ulam sequences for large v*

>

## Equidistribution, $\text{Ulam}(3,v)$ vs $[3, v, 3+v, 3+3+v, \dots]$

> *#plot of  $\text{ulam}(3,4)$  with nothing subtracted*  
*before := listdensityplot([ [3, 4, 7, 10, 11, 13, 15, 16, 21, 22, 27, 30, 35, 36, 41, 44, 50, 53,*  
*55, 61, 69, 70, 75, 78, 84, 87, 92, 93, 98, 101],*  
*[3, 5, 8, 11, 13, 14, 17, 18, 20, 24, 26, 30, 39, 40, 45, 46, 49, 67, 71, 73, 74, 77, 92, 98, 99,*  
*102, 114, 124, 134, 135],*  
*[3, 7, 10, 13, 16, 17, 19, 22, 24, 25, 28, 30, 34, 36, 42, 51, 56, 60, 62, 65, 77, 88, 89, 91, 106,*  
*109, 114, 115, 126, 129],*  
*[3, 8, 11, 14, 17, 19, 20, 23, 26, 27, 29, 32, 33, 38, 39, 45, 51, 54, 60, 63, 67, 73, 75, 76, 82,*  
*85, 88, 91, 103, 110],*  
*[3, 10, 13, 16, 19, 22, 23, 25, 28, 31, 33, 34, 37, 39, 40, 45, 46, 51, 57, 63, 66, 72, 75, 83, 89,*  
*92, 93, 98, 101, 104],*  
*[3, 11, 14, 17, 20, 23, 25, 26, 29, 32, 35, 36, 38, 41, 42, 44, 48, 50, 54, 60, 66, 75, 84, 87, 88,*  
*94, 97, 99, 109, 133],*  
*[3, 13, 16, 19, 22, 25, 28, 29, 31, 34, 37, 40, 42, 43, 46, 48, 49, 52, 54, 58, 60, 66, 72, 78, 87,*  
*96, 99, 104, 110, 113],*

[3, 14, 17, 20, 23, 26, 29, 31, 32, 35, 38, 41, 44, 45, 47, 50, 51, 53, 56, 57, 62, 63, 69, 75, 81, 87, 90, 96, 99, 115],

[3, 16, 19, 22, 25, 28, 31, 34, 35, 37, 40, 43, 46, 49, 51, 52, 55, 57, 58, 61, 63, 64, 69, 70, 75, 81, 87, 93, 99, 102],

[3, 17, 20, 23, 26, 29, 32, 35, 37, 38, 41, 44, 47, 50, 53, 54, 56, 59, 60, 62, 65, 66, 68, 72, 74, 78, 84, 90, 96, 102],

[3, 19, 22, 25, 28, 31, 34, 37, 40, 41, 43, 46, 49, 52, 55, 58, 60, 61, 64, 66, 67, 70, 72, 73, 76, 78, 82, 84, 90, 96],

[3, 20, 23, 26, 29, 32, 35, 38, 41, 43, 44, 47, 50, 53, 56, 59, 62, 63, 65, 68, 69, 71, 74, 75, 77, 80, 81, 86, 87, 93],

[3, 22, 25, 28, 31, 34, 37, 40, 43, 46, 47, 49, 52, 55, 58, 61, 64, 67, 69, 70, 73, 75, 76, 79, 81, 82, 85, 87, 88, 93],

[3, 23, 26, 29, 32, 35, 38, 41, 44, 47, 49, 50, 53, 56, 59, 62, 65, 68, 71, 72, 74, 77, 78, 80, 83, 84, 86, 89, 90, 92],

[3, 25, 28, 31, 34, 37, 40, 43, 46, 49, 52, 53, 55, 58, 61, 64, 67, 70, 73, 76, 78, 79, 82, 84, 85, 88, 90, 91, 94, 96],

[3, 26, 29, 32, 35, 38, 41, 44, 47, 50, 53, 55, 56, 59, 62, 65, 68, 71, 74, 77, 80, 81, 83, 86, 87, 89, 92, 93, 95, 98],

[3, 28, 31, 34, 37, 40, 43, 46, 49, 52, 55, 58, 59, 61, 64, 67, 70, 73, 76, 79, 82, 85, 87, 88, 91, 93, 94, 97, 99, 100],

[3, 29, 32, 35, 38, 41, 44, 47, 50, 53, 56, 59, 61, 62, 65, 68, 71, 74, 77, 80, 83, 86, 89, 90, 92, 95, 96, 98, 101, 102],

[3, 31, 34, 37, 40, 43, 46, 49, 52, 55, 58, 61, 64, 65, 67, 70, 73, 76, 79, 82, 85, 88, 91, 94, 96, 97, 100, 102, 103, 106],

[3, 32, 35, 38, 41, 44, 47, 50, 53, 56, 59, 62, 65, 67, 68, 71, 74, 77, 80, 83, 86, 89, 92, 95, 98, 99, 101, 104, 105, 107],

[3, 34, 37, 40, 43, 46, 49, 52, 55, 58, 61, 64, 67, 70, 71, 73, 76, 79, 82, 85, 88, 91, 94, 97, 100, 103, 105, 106, 109, 111],

[3, 35, 38, 41, 44, 47, 50, 53, 56, 59, 62, 65, 68, 71, 73, 74, 77, 80, 83, 86, 89, 92, 95, 98, 101, 104, 107, 108, 110, 113],

[3, 37, 40, 43, 46, 49, 52, 55, 58, 61, 64, 67, 70, 73, 76, 77, 79, 82, 85, 88, 91, 94, 97, 100, 103, 106, 109, 112, 114, 115],

[3, 38, 41, 44, 47, 50, 53, 56, 59, 62, 65, 68, 71, 74, 77, 79, 80, 83, 86, 89, 92, 95, 98, 101, 104, 107, 110, 113, 116, 117],

[3, 40, 43, 46, 49, 52, 55, 58, 61, 64, 67, 70, 73, 76, 79, 82, 83, 85, 88, 91, 94, 97, 100, 103, 106, 109, 112, 115, 118, 121],

[3, 41, 44, 47, 50, 53, 56, 59, 62, 65, 68, 71, 74, 77, 80, 83, 85, 86, 89, 92, 95, 98, 101, 104, 107, 110, 113, 116, 119, 122],

[3, 43, 46, 49, 52, 55, 58, 61, 64, 67, 70, 73, 76, 79, 82, 85, 88, 89, 91, 94, 97, 100, 103, 106, 109, 112, 115, 118, 121, 124],

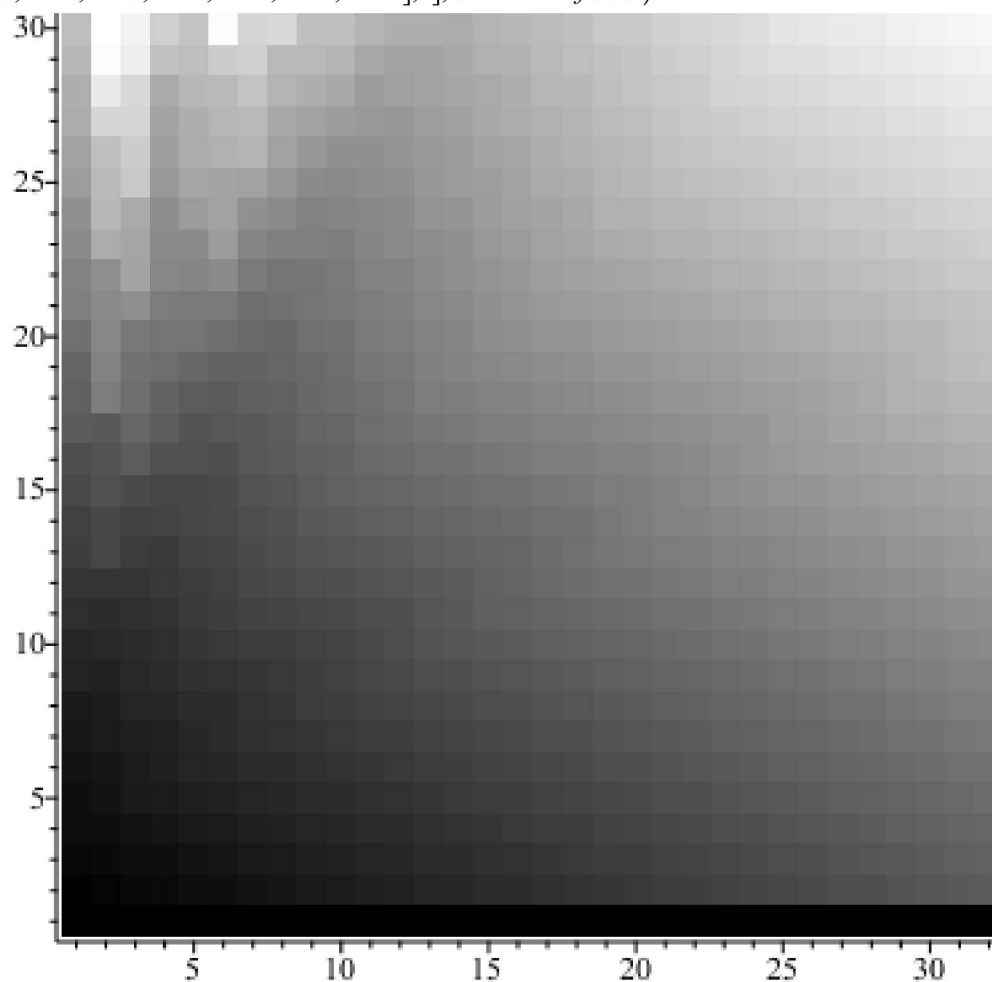
[3, 44, 47, 50, 53, 56, 59, 62, 65, 68, 71, 74, 77, 80, 83, 86, 89, 91, 92, 95, 98, 101, 104, 107, 110, 113, 116, 119, 122, 125],

[3, 46, 49, 52, 55, 58, 61, 64, 67, 70, 73, 76, 79, 82, 85, 88, 91, 94, 95, 97, 100, 103, 106, 109, 112, 115, 118, 121, 124, 127],

[3, 47, 50, 53, 56, 59, 62, 65, 68, 71, 74, 77, 80, 83, 86, 89, 92, 95, 97, 98, 101, 104, 107, 110, 113, 116, 119, 122, 125, 128],

[3, 49, 52, 55, 58, 61, 64, 67, 70, 73, 76, 79, 82, 85, 88, 91, 94, 97, 100, 101, 103, 106, 109, 112, 115, 118, 121, 124, 127, 130],

[3, 50, 53, 56, 59, 62, 65, 68, 71, 74, 77, 80, 83, 86, 89, 92, 95, 98, 101, 103, 104, 107, 110, 113, 116, 119, 122, 125, 128, 131], ], *smooth=false*)



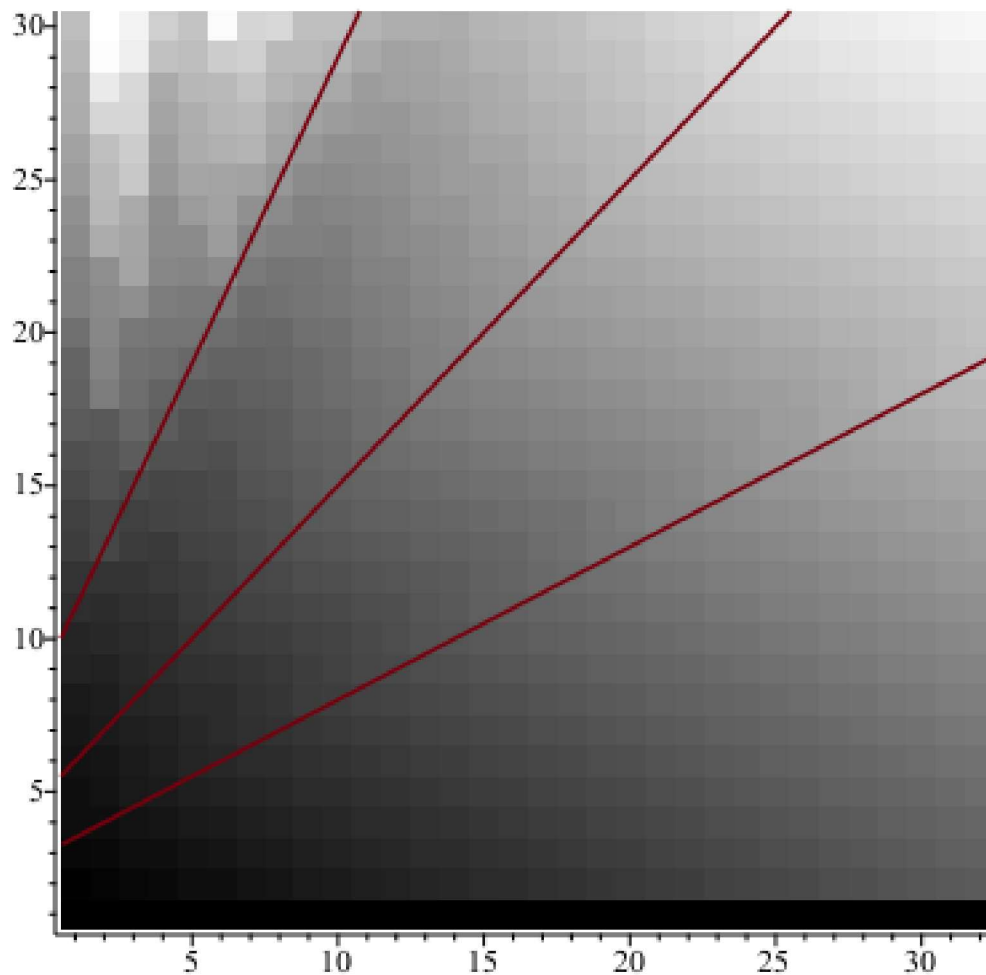
>  $f := x \rightarrow x + 5 : g := x \rightarrow \frac{x}{2} + 3 : h := x \rightarrow 2 \cdot x + 9 :$

$plot_h := plot\left(h, \frac{1}{2}..10 + \frac{3}{4}\right) :$

$plot_l := plot\left(f, \frac{1}{2}..25 + \frac{1}{2}\right) :$

$plot_g := plot\left(g, \frac{1}{2}..32 + \frac{1}{2}\right) :$

> *with(plots) :*  
 $display(plot_l, before, plot_g, plot_h)$

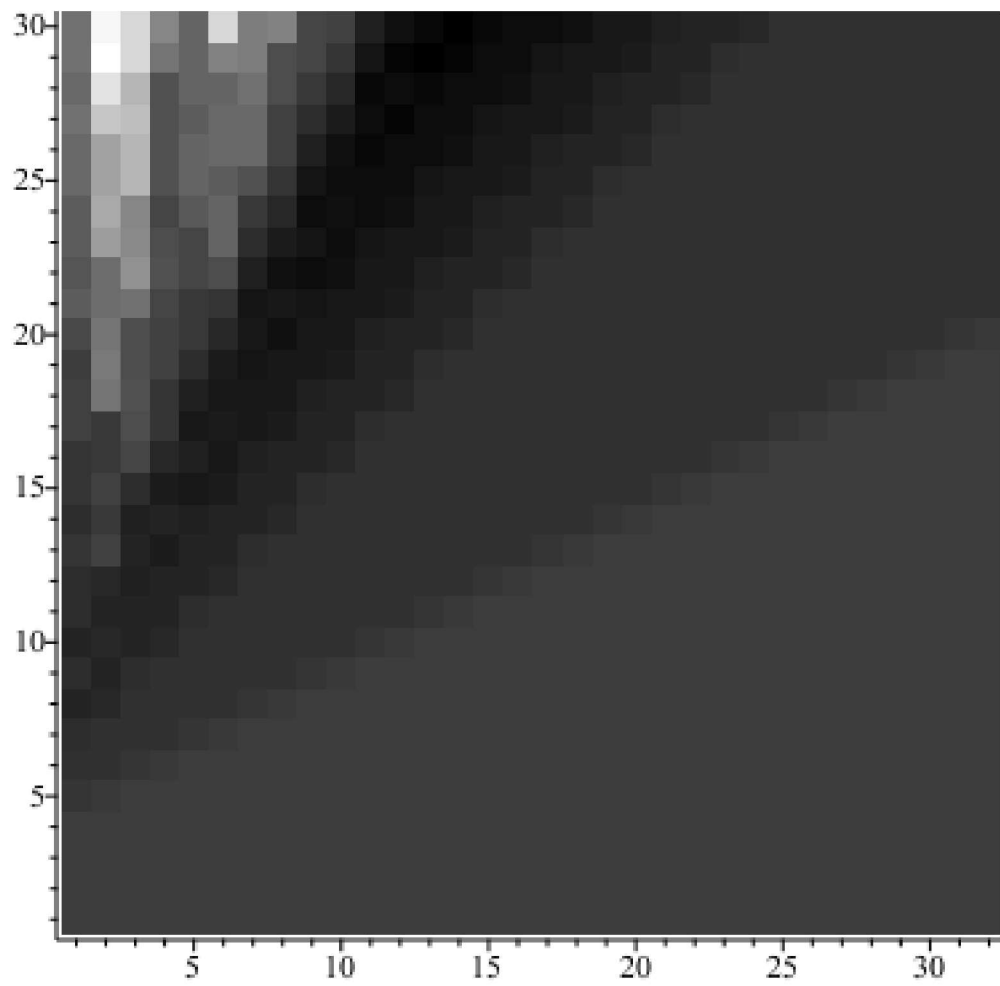


>

>

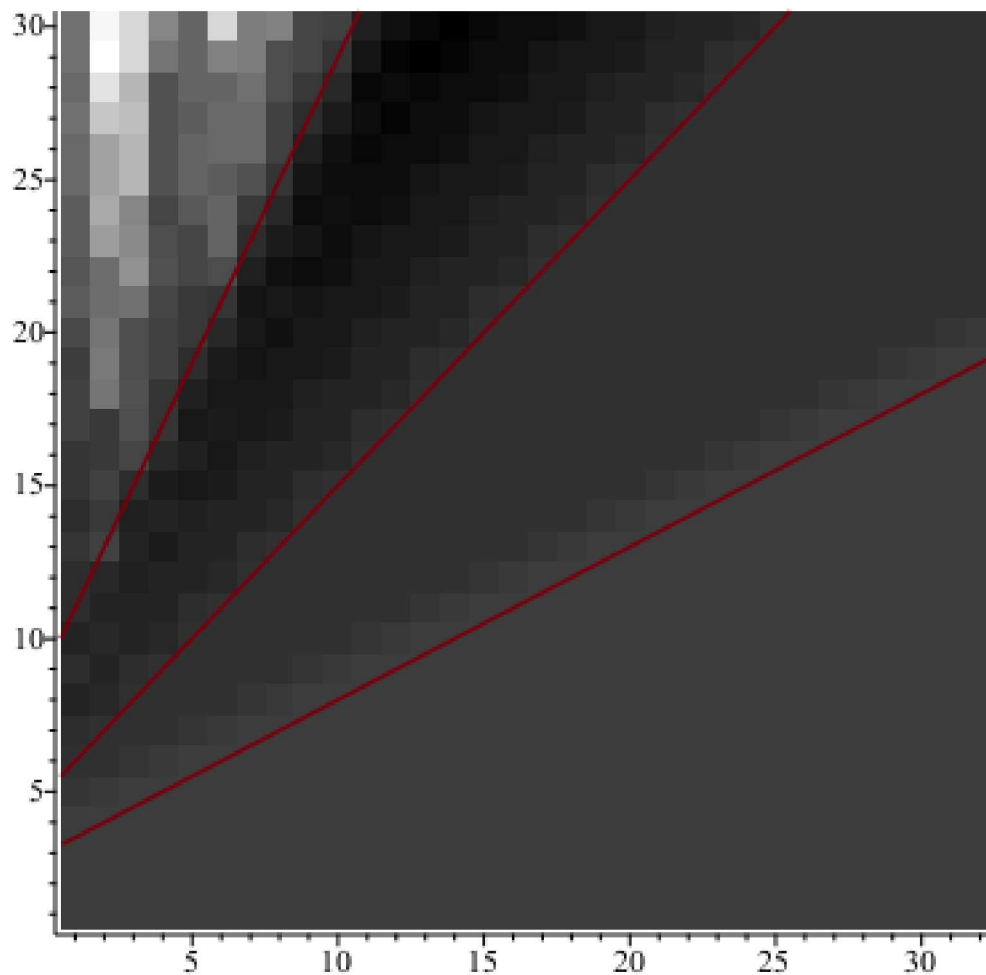
```
> matrix := listdensityplot([ [0, 0, 0, 0, -2, -3, -4, -6, -4, -6, -4, -4, -2, -4, -2,
-2, 1, 1, 0, 3, 8, 6, 8, 8, 11, 11, 13, 11, 13, 13 ],
[0, 0, 0, 0, -1, -3, -3, -5, -6, -5, -6, -5, 1, -1, 1, -1, -1, 14, 15, 14, 12, 12, 24,
27, 25, 25, 34, 41, 48, 46],
[0, 0, 0, 0, 0, -2, -3, -3, -4, -6, -6, -7, -6, -7, -4, 2, 4, 5, 4, 4, 13, 21, 19, 18, 30,
30, 32, 30, 38, 38 ],
[0, 0, 0, 0, 0, -1, -3, -3, -3, -5, -6, -6, -8, -6, -8, -5, -2, -2, 1, 1, 2, 5, 4, 2,
5, 5, 5, 5, 14, 18],
[0, 0, 0, 0, 0, 0, -2, -3, -3, -3, -4, -6, -6, -7, -9, -7, -9, -7, -4, -1, -1, 2,
2, 7, 10, 10, 8, 10, 10, 10],
[0, 0, 0, 0, 0, 0, -1, -3, -3, -3, -3, -5, -6, -6, -8, -9, -8, -9, -8, -5, -2, 4,
10, 10, 8, 11, 11, 10, 17, 38],
[0, 0, 0, 0, 0, 0, 0, -2, -3, -3, -3, -3, -4, -6, -6, -7, -9, -9, -10, -9, -10,
-7, -4, -1, 5, 11, 11, 13, 16, 16],
[0, 0, 0, 0, 0, 0, 0, -1, -3, -3, -3, -3, -3, -5, -6, -6, -8, -9, -9, -11, -9,
-11, -8, -5, -2, 1, 1, 4, 4, 17],
[0, 0, 0, 0, 0, 0, 0, 0, -2, -3, -3, -3, -3, -4, -6, -6, -7, -9, -9, -10, -12,
-10, -12, -10, -7, -4, -1, 2, 2],
[0, 0, 0, 0, 0, 0, 0, 0, -1, -3, -3, -3, -3, -3, -3, -5, -6, -6, -8, -9, -9, -11,
```

-12, -11, -12, -11, -8, -5, -2, 1],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, -2, -3, -3, -3, -3, -3, -3, -3, -4, -6, -6, -7, -9, -9, -10,  
 -12, -12, -13, -12, -13, -10, -7],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, -1, -3, -3, -3, -3, -3, -3, -3, -3, -5, -6, -6, -8, -9, -9,  
 -11, -12, -12, -14, -12, -14, -11],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -2, -3, -3, -3, -3, -3, -3, -3, -4, -6, -6, -7, -9,  
 -9, -10, -12, -12, -13, -15, -13],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -1, -3, -3, -3, -3, -3, -3, -3, -3, -5, -6, -6, -8,  
 -9, -9, -11, -12, -12, -14, -15],  
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 -9, -9, -10, -12, -12, -13],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -1, -3, -3, -3, -3, -3, -3, -3, -3, -5, -6, -6,  
 -8, -9, -9, -11, -12, -12],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -2, -3, -3, -3, -3, -3, -3, -3, -3, -4, -6,  
 -6, -7, -9, -9, -10, -12],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -1, -3, -3, -3, -3, -3, -3, -3, -3, -3, -5,  
 -6, -6, -8, -9, -9, -11],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -2, -3, -3, -3, -3, -3, -3, -3, -3, -3, -4,  
 -6, -6, -7, -9, -9],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -1, -3, -3, -3, -3, -3, -3, -3, -3, -3, -3,  
 -5, -6, -6, -8, -9],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -2, -3, -3, -3, -3, -3, -3, -3, -3, -3,  
 -3, -4, -6, -6, -7],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -1, -3, -3, -3, -3, -3, -3, -3, -3, -3,  
 -3, -3, -5, -6, -6],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -2, -3, -3, -3, -3, -3, -3, -3, -3, -3,  
 -3, -3, -4, -6],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -1, -3, -3, -3, -3, -3, -3, -3, -3, -3,  
 -3, -3, -3, -5],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -2, -3, -3, -3, -3, -3, -3, -3, -3, -3,  
 -3, -3, -3, -3],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -1, -3, -3, -3, -3, -3, -3, -3, -3, -3,  
 -3, -3, -3, -3],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -2, -3, -3, -3, -3, -3, -3, -3, -3,  
 -3, -3, -3],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -1, -3, -3, -3, -3, -3, -3, -3, -3, -3,  
 -3, -3, -3],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -2, -3, -3, -3, -3, -3, -3, -3, -3,  
 -3, -3, -3],  
 [0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, -1, -3, -3, -3, -3, -3, -3, -3, -3, -3,  
 -3, -3, -3], *smooth=false*)



```
>
```

```
> with(plots) :  
  display(matrx, plotl, plotg, ploth)
```



```
> rangleplot := listdensityplot([ [0.0547477697704688, 0.4063303596939585,
  0.4610781294644273, 0.5158258992348963, 0.8674084891583855,
  0.5705736690053653, 0.2737388488523438, 0.6253214387758339,
  0.3832343883932827, 0.7348169783167711, 0.492729927934219,
  0.5474776977046876, 0.3053906473221364, 0.6569732372456265,
  0.4148861868630753, 0.4696339566335421, 0.5791294961744811,
  0.6338772659449496, 0.3370424457919263, 0.44653798533286704,
  0.25919870472078443, 0.6107812946442728, 0.3686942442617216,
  0.4234420140321902, 0.5329375535731309, 0.5876853233435995,
  0.3455982729610412, 0.6971808628845366, 0.45509381250198544,
  0.5098415822724505 ],
[0.9572684847138004, 0.5954474745230007, 0.5527159592368012, 0.5099844439506018,
  0.14816343375980168, 0.4672529286644025, 0.42452141337820226,
  0.7436109082828022, 0.3817898980920029, 0.6581478777104035,
  0.29632686751960335, 0.5726848471380048, 0.44449030127940503,
  0.7635797961840058, 0.35902727070700813, 0.6781167656116072,
  0.6353852503254078, 0.37899615860821356, 0.6553541382266133,
  0.29353312803581133, 0.6126226229404104, 0.569891107654211,
  0.35623353122321433, 0.27077050065081565, 0.5898599955554182,
  0.5471284802692153, 0.376202419124418, 0.5670973681704226,
  0.7579923172164271, 0.07708181212102261 ],
```

[0.033889964760785984, 0.4124099177751672, 0.44629988253595343, 0.48018984729673964, 0.5140798120575258, 0.8587098003111215, 0.5479697768183112, 0.5818597415790974, 0.2711197180862879, 0.6157497063398836, 0.6496396711006689, 0.3388996476078603, 0.7174196006222431, 0.4066795771294327, 0.4744595066510051, 0.5761294009333646, 0.2992793422013378, 0.6777992952157206, 0.367059271722912, 0.4009492364836973, 0.5365090955268421, 0.32743896631638947, 0.6720689545699834, 0.3613289310771748, 0.5307787548811049, 0.5646687196418938, 0.2878186609098705, 0.6324486491634644, 0.4233785199530118, 0.45726848471380066 ],

[0.9710784469348234, 0.589542525159529, 0.5606209720943522, 0.5316994190291755, 0.5027778659639992, 0.15016349725388078, 0.473856312898822, 0.44493475983364483, 0.4160132067684703, 0.7397060224134098, 0.38709165370329224, 0.35817010063811594, 0.6818629162830572, 0.30032699450776157, 0.6240198101527028, 0.5661767040223502, 0.5083335978919976, 0.47941204482681954, 0.42156893869646694, 0.39264738563128887, 0.6874186482110574, 0.6295755420807048, 0.2769611733705837, 0.6006539890155231, 0.5428108828851705, 0.513889329819996, 0.48496777675481795, 0.4560462236896434, 0.3403600114289347, 0.6062097209435251 ],

[0.023556303374710152, 0.4118543445823679, 0.4354106479570774, 0.45896695133178866, 0.48252325470649815, 0.5060795580812094, 0.8472649925394453, 0.5296358614559189, 0.5531921648306284, 0.5767484682053396, 0.25911933712181323, 0.6003047715800491, 0.6238610749547604, 0.306231943871234, 0.6474173783294717, 0.35334455062065295, 0.6945299850788906, 0.40045715737007725, 0.4475697641194962, 0.4946823708689152, 0.5182386742436265, 0.565351280993049, 0.5889075843677567, 0.31839106003365103, 0.36550366678307, 0.38905997015778127, 0.7302454046160207, 0.4361725769072038, 0.45972888028191505, 0.4832851836566192 ],

[0.9784120130797803, 0.5875107146258607, 0.5659227277056411, 0.5443347407854224, 0.522746753865202, 0.5011587669449824, 0.1534334423315027, 0.4795707800247637, 0.45798279310454326, 0.4363948061843228, 0.41480681926410234, 0.7409441569573634, 0.39321883234388366, 0.3716308454236632, 0.6977681831169242, 0.35004285850344274, 0.6545922092764851, 0.3068668846630054, 0.611416235436046, 0.568240261595605, 0.5250642877551677, 0.4603003269945063, 0.39553636623384847, 0.37394837931362446, 0.7000857170068855, 0.6569097431664517, 0.6353217562462277, 0.2875964316327497, 0.5489698085653529, 0.37626591320358926 ],

[0.018889488555192235, 0.4151877837391664, 0.4340772722943589, 0.45296676084955045, 0.471856249404742, 0.49074573795993537, 0.5096352265151278, 0.8492650560335253, 0.5285247150703185, 0.5474142036255127, 0.5663036921807034, 0.5851931807358959, 0.26445283977269085, 0.6040826692910901, 0.6229721578462808, 0.30223181688307577, 0.6418616464014733, 0.6607511349566657, 0.3400107939934607, 0.6985301120670506, 0.37778977110384204, 0.4155687482142305, 0.4533477253246154, 0.4911267024349968,



0.5477951681005742, 0.6044636337661515, 0.6233531223213404,  
0.3215022699133314, 0.35928124702371633, 0.37817073557890524 ],  
[0.982888345661767, 0.5868122797549127, 0.5697006254166794, 0.5525889710784462,  
0.5354773167402138, 0.5183656624019797, 0.5012540080637482,  
0.1565129051715921, 0.48414235372551495, 0.4670306993872817,  
0.44991904504904845, 0.432807390710817, 0.4156957363725837,  
0.7433251849265066, 0.3985840820343505, 0.3814724276961172,  
0.7091018762500383, 0.36436077335788397, 0.3472491190196507,  
0.6748785675735753, 0.3130258103431842, 0.6406552588971088,  
0.6064319502206423, 0.5722086415441723, 0.5379853328677129,  
0.5037620241912464, 0.48665036985301313, 0.4524270611765431,  
0.4353154068383134, 0.6773865837010717 ],  
[0.015032223245182497, 0.413505190640973, 0.42853741388615596,  
0.4435696371313371, 0.45860186037652007, 0.4736340836217021,  
0.48866630686688417, 0.503698530112068, 0.8420426045271281, 0.51873075335725,  
0.5337629766024339, 0.5487951998476142, 0.5638274230927962,  
0.5788596463379783, 0.255547795168102, 0.5938918695831639,  
0.6089240928283459, 0.2856122416584661, 0.6239563160735244, 0.63898853931871,  
0.3156766881488302, 0.6540207625638921, 0.34574113463919787,  
0.6840852090542562, 0.37580558112956197, 0.4058700276199225,  
0.4359344741102902, 0.4659989206006543, 0.4960633670910184,  
0.511095590336204 ],  
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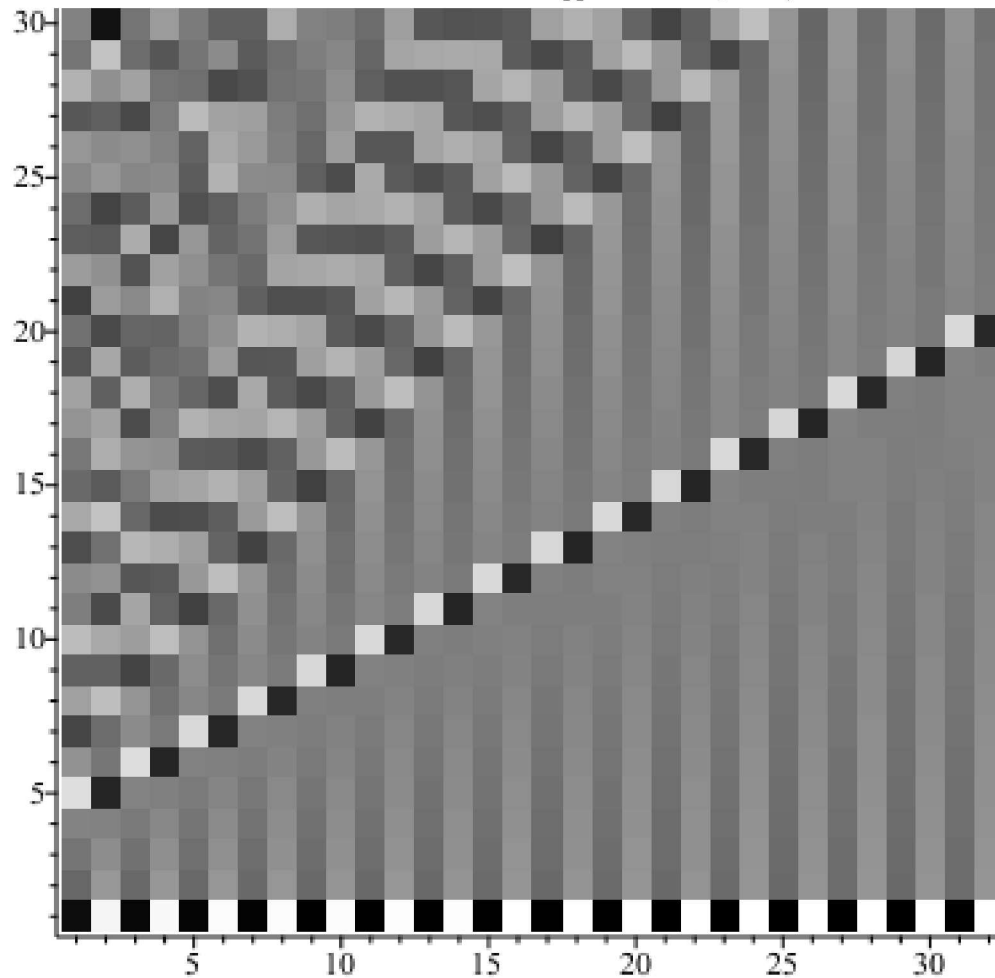
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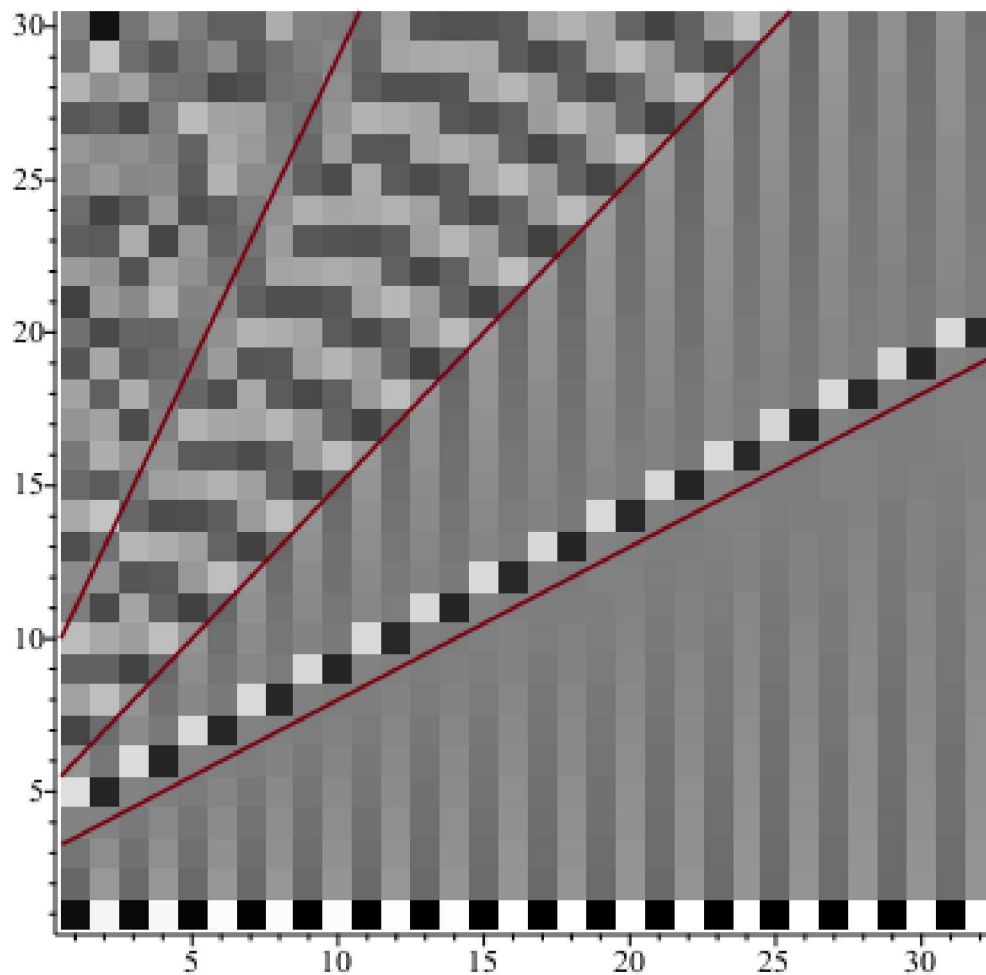
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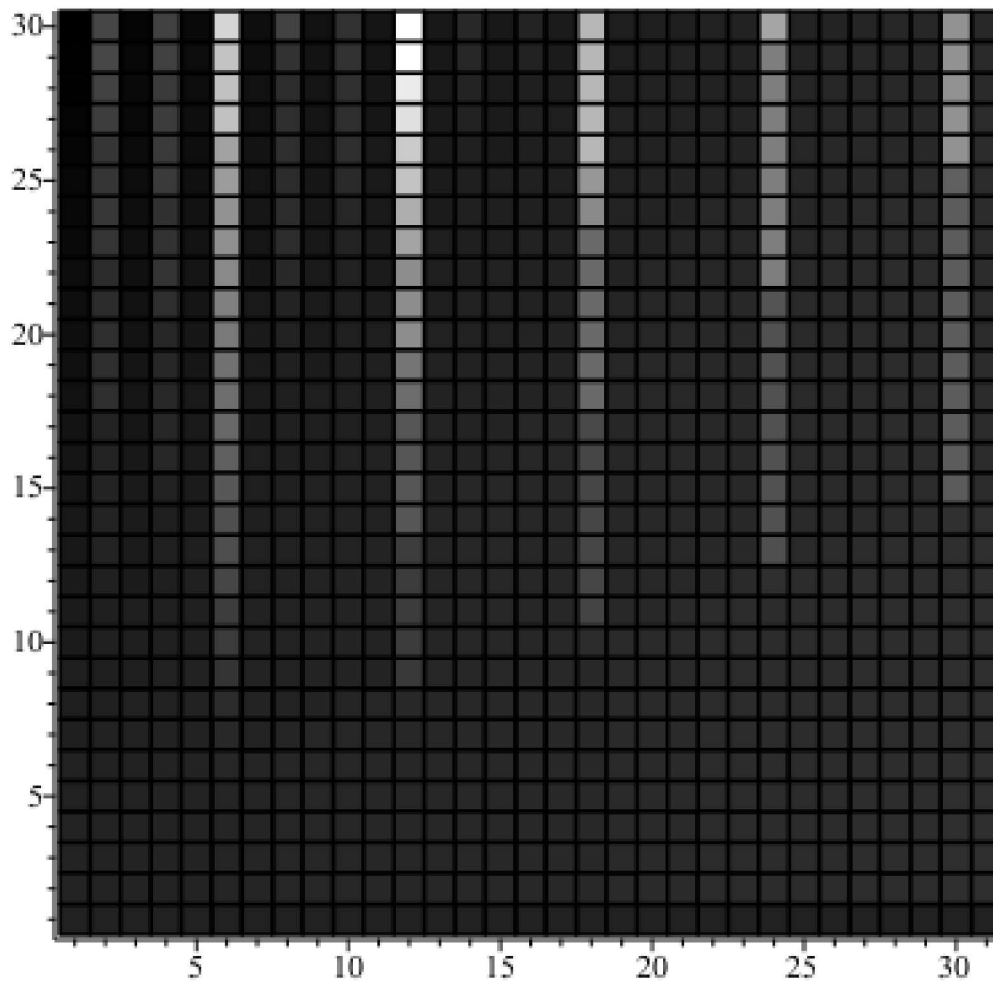


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0.5477634210609885, 0.8826311946411032, 0.4407441506079586,  
0.5523667418013289, 0.5569700625416694, 0.4499507920886394,  
0.5615733832820133, 0.5661767040223502 ]])

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$$0.5000000000000071, 0.5 ],$$

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[ 0.5, 0., 0.5, 0., 0.5, 0., 0.5, 0.5, 0., 0.5, 7.105427357601002  $e^{-15}$ , 0.5, 0.5, 0., 0.5,

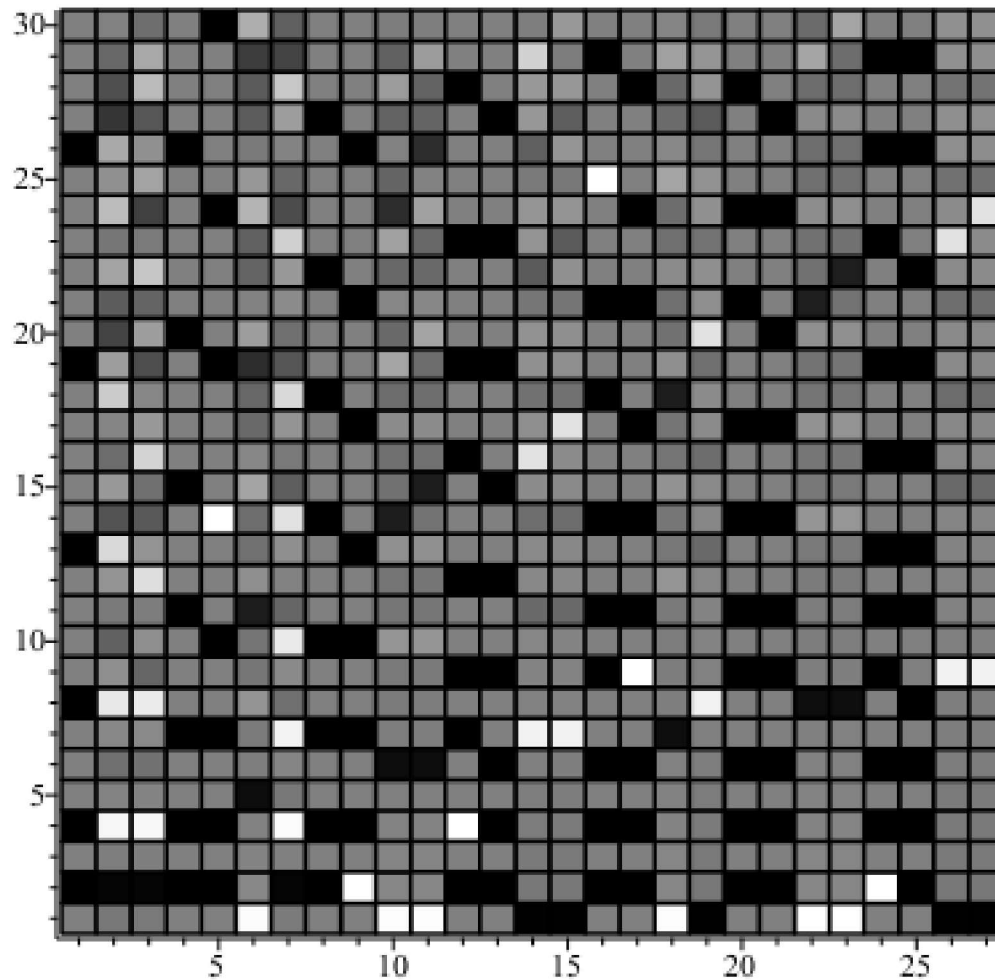
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0.4416330677164382, 0.5553985840820275, 0.5601765135401138,  
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```
0.5615733832820133, 0.5661767040223502 ]]
```

```
> listdensityplot(M9);
```



```
> plot(M9)
```

Error, (in plot) found points with fewer or more than 2 components

```
> #when v is odd
```

```
M9odd := matrix([ [0.47179275532556586, 0.021080034286803162,
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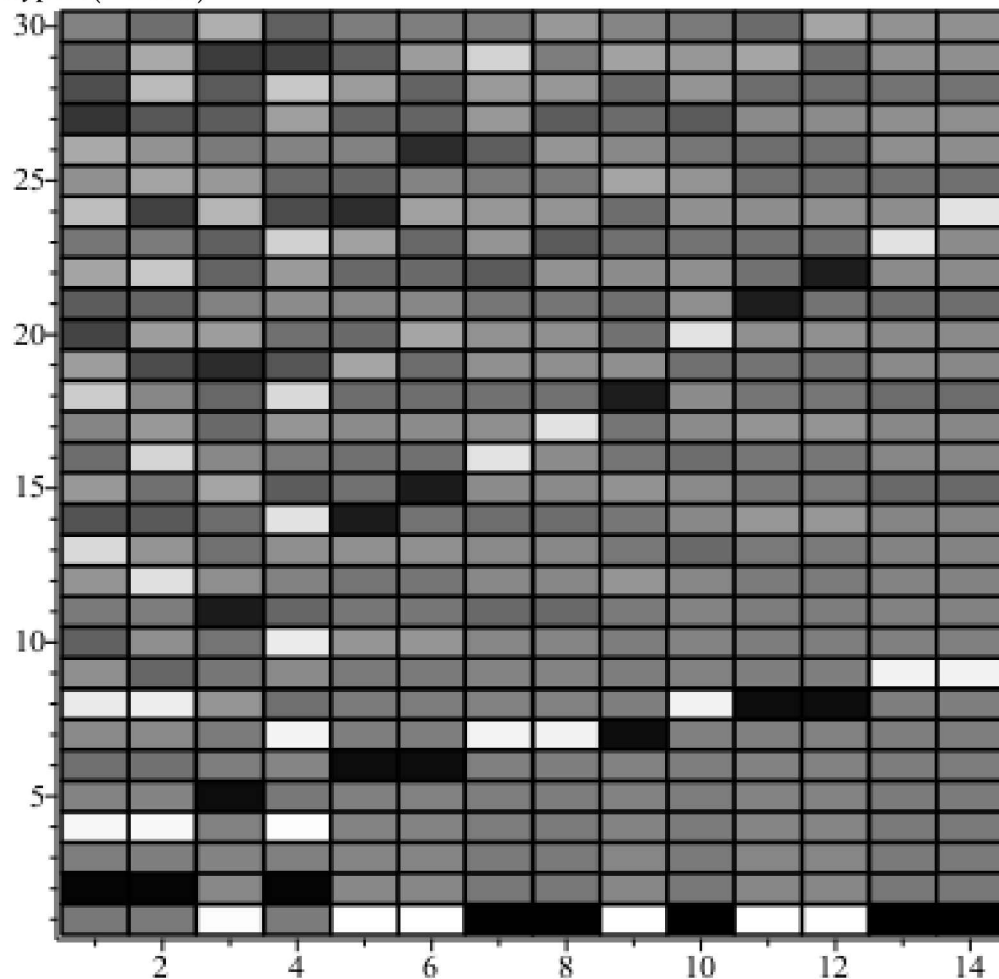
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