```
restart:maple_mode(0):cas_setup(0,0,0,1,0,1e-10,25,[1,50,0,25],0,0,0);
```

```
Warning: some commands like subs might change arguments order
```

Attention pour les utilisateurs de maple, root[3](23) ne marche pas, il fait juste racin

```
root(3,23);
```

$$23^{\frac{1}{3}}$$

```
surd(23,3);//c'est plutot celui ci que l'on trouve dans la doc
```

$$23^{\frac{1}{3}}$$

```
root(3,23.);evalf(root(3,23.));root(3,approx(23));
```

```
evalf(Pi,1000);approx(Pi,1000);
```

3.14159265358979323846264338327950288419716939937510582097494459

```
maple_mode(0);evalf(E);evalf(e);
```

```
maple_mode(1);evalf(E);evalf(e);evalf(exp(1));
```

```
maple_mode(0);
```

```
Warning: some commands like subs might change arguments order
```

Attention mettre plusieurs Digits:= sur une meme ligne a l'air de poser probleme?

```
Digits:=1000;
```

```
1000
```

```
sqrt(2.0);
```

1.41421356237309504880168872420969807856967187537694807317667973

```
Digits:=10;
```

```
10
```

```
sqrt(3.0);
```

```
1.732050808
```

```
EXERCICE
```

```
l:=[1,33,4];
```

17
```
augment(l,55);
```
[1, 33, 4, 55]

18
```
a:=11111;
```
11111

19
```
purge(a);
```
11111

20
```
a;
```
a

21
```
pp1:=44*atan(1/57)+7*atan(1/239)-12*atan(1/682)+24*atan(1/12943);
```
$$24*\text{atan}\left(\frac{1}{12943}\right)+7*\text{atan}\left(\frac{1}{239}\right)+44*\text{atan}\left(\frac{1}{57}\right)-12*\text{atan}\left(\frac{1}{682}\right)$$

22
```
simplify(pp1); //ou peut etre tsimplify
```
$$\frac{1}{4}*\pi$$

23
```
l2:=[11,133,14];
```
[11, 133, 14]

24
```
concat(l1,l2);
```
[$l1$, 11, 133, 14]

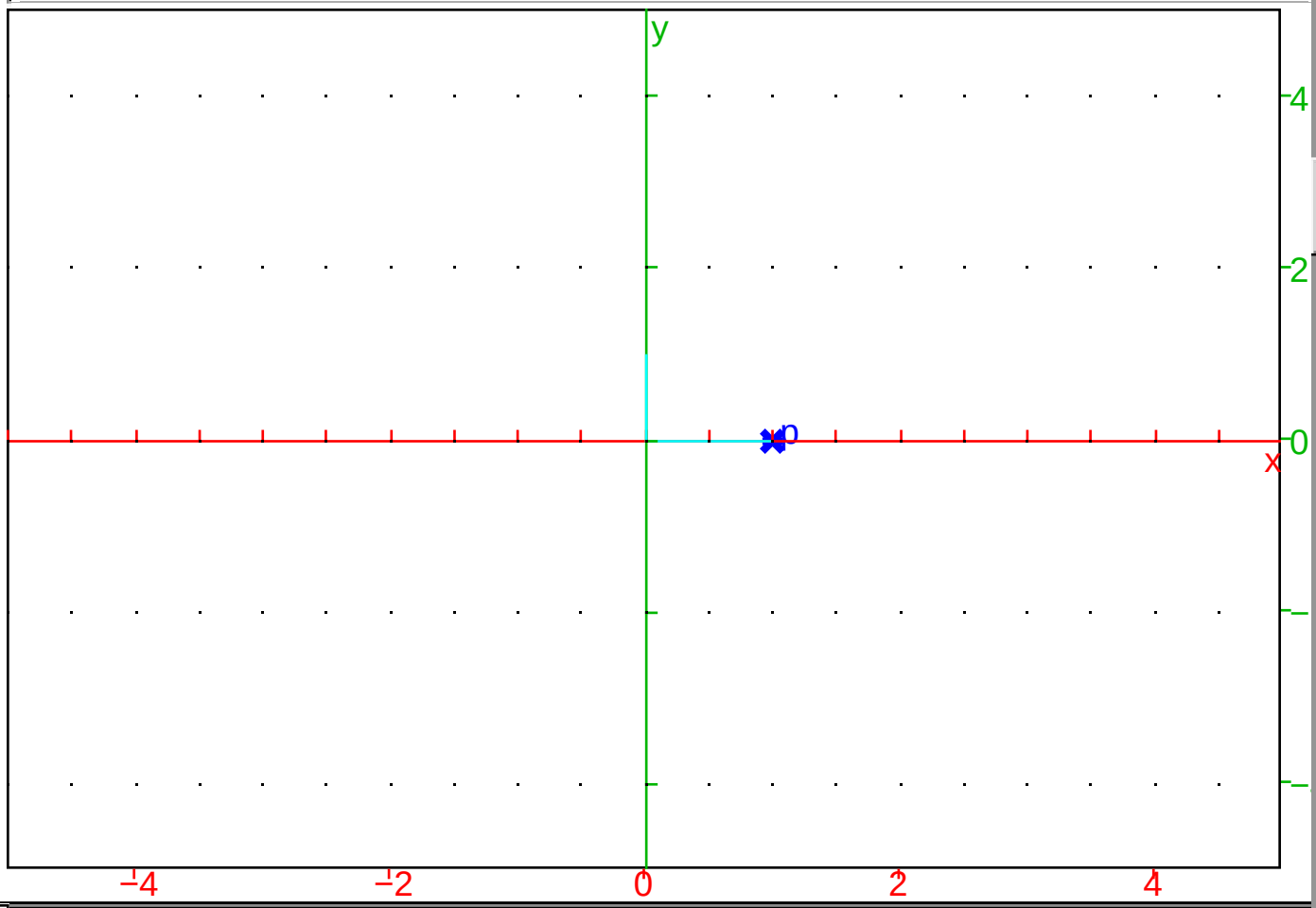
25
```
a:=exp(i*pi/5);
```
$$\frac{i*(\sqrt{-2*(\sqrt{5})+10})}{4}+\frac{\sqrt{5}+1}{4}$$

26
```
simplify(a+exp(i*pi/3));
```
rootof([[5307-13074*i, 4234-7853*i, -693883+1729870*i, 298410-1005795*i,

27
```
simplify(7^(1/3)+sqrt(5));
```

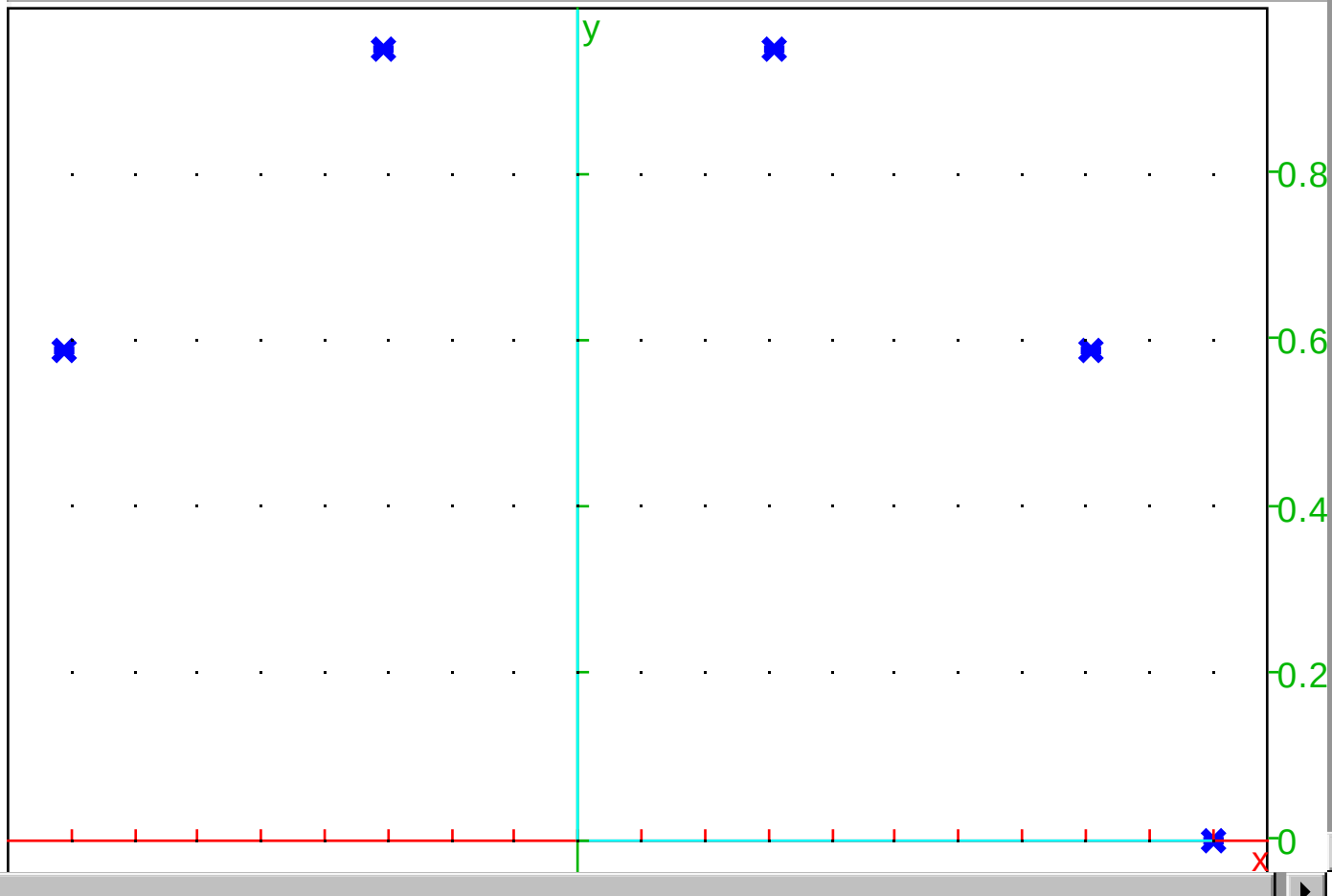
28

```
p:=point(1,display=bleu+epaisseur_point_3+point_etoile);
```



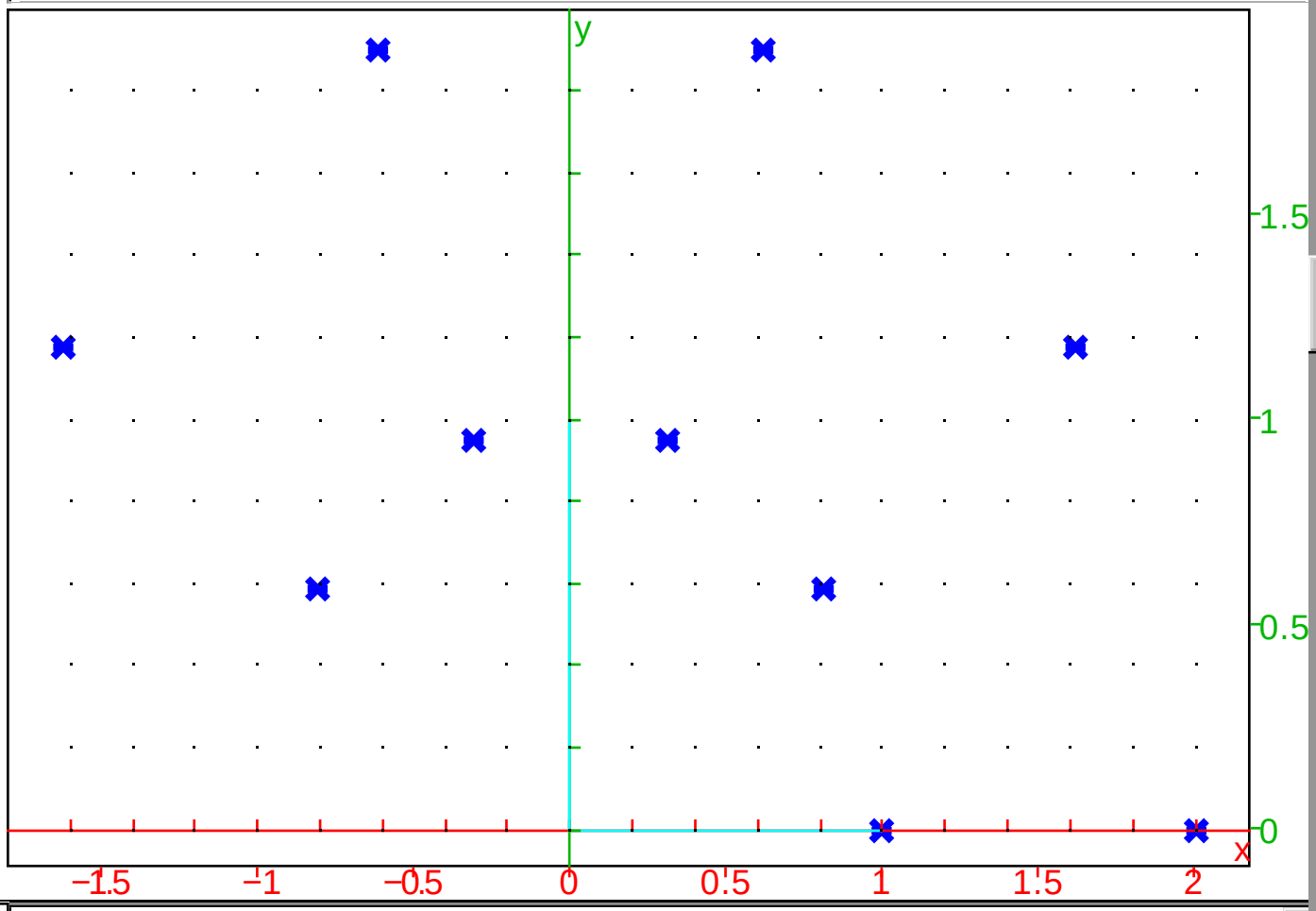
29

```
seq(p*a^j,j=0..4);
```

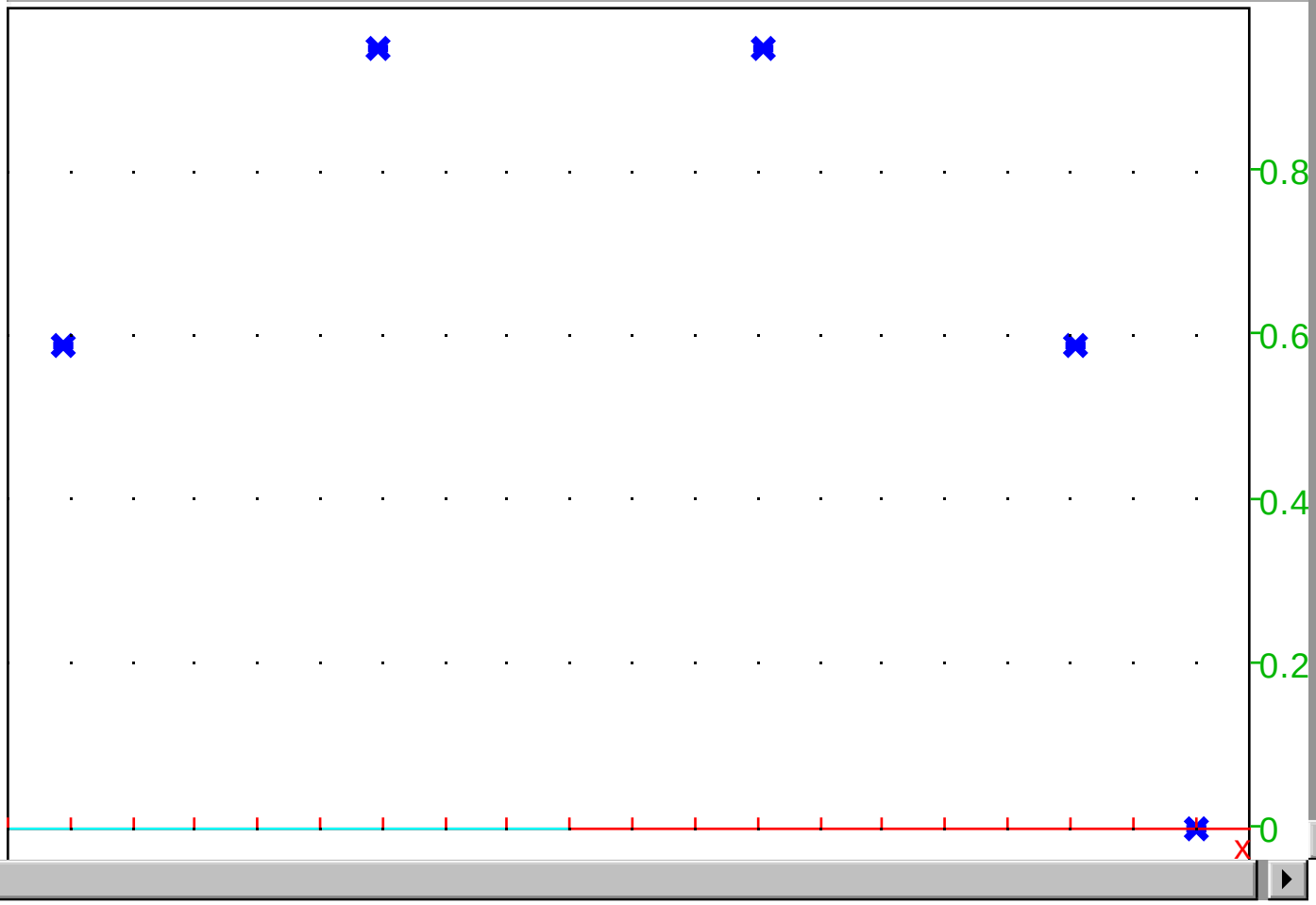


30

```
[seq(p*a^j,j=0..4)];[seq(p*a^j,j=0..4)]*2;
```



31



32
```
1_(dm^3)+3_cl;//On ajoute 2 volumes.
```
$$1.03\_dm^3$$

33
```
purge(x);// pour etre sur que x est libre.
```
No such variable x

34
```
x=='x';//vaut 1 si x est libre. Car dans ce cas, x il coincide avec le
```
vrai

35
```
P:=x/(x^2+1);
```
$$\frac{x}{x^2+1}$$

36
```
Q:=x->sin(1/x);
```
// Succès
// End defining Q

$$x \to \sin\left(\frac{1}{x}\right)$$

37
```
type(P);//un symbole
```
DOM_SYMBOLIC

38
```
type(Q);//une fonction
```
DOM_FUNC

39
```
type(Q(x));//un symbole
```
DOM_SYMBOLIC

40
```
type(Q(5));//un symbole car sin(1/5) est laisse tel quel
```
DOM_SYMBOLIC

41
```
type(normal(Q(6/pi)));// un rationel car c'est une valeur remarquable
```
DOM_RAT

42
```
diff(P,x);
```
$$-\frac{2*x^2}{(x^2+1)^2}+\frac{1}{x^2+1}$$

43
```
function_diff(Q);
```
// Succès

$$`x` \to -\frac{\cos\left(\frac{1}{`x`}\right)}{2}$$

44
```
Q';
```

$$x \to -\frac{\cos\left(\frac{1}{x}\right)}{x^2}$$

45
```
(Q@@7)(y);
```

$$\sin\left(\frac{1}{\sin\left(\frac{1}{\sin\left(\frac{1}{\sin\left(\frac{1}{\sin\left(\frac{1}{\sin\left(\frac{1}{\sin\left(\frac{1}{\sin\left(\frac{1}{y}\right)}\right)}\right)}\right)}\right)}\right)}\right)}\right)$$

46
```
unapply(P,x);// cr\'ee la fonction P
```

$$x \to \frac{x}{x^2+1}$$

47
```
simplify(function_diff(unapply(P,x)(0)));// cr\'ee la fonction P et la
```

```
// Succès
```

$$\text{`x`} \to -\frac{\cos\left(\frac{1}{\text{`x`}}\right)^3}{\text{`x`}^2 * \cos\left(\frac{1}{\text{`x`}}\right)^4 - 4 * \text{`x`}^2 * \cos\left(\frac{1}{\text{`x`}}\right)^2 + 4 * \text{`x`}^2}$$

48
```
simplify(diff(sin(1/x)/(sin(1/x)^2+1),x));//verif
```

$$-\frac{\cos\left(\frac{1}{x}\right)^3}{x^2 * \cos\left(\frac{1}{x}\right)^4 - 4 * x^2 * \cos\left(\frac{1}{x}\right)^2 + 4 * x^2}$$

49
```
f(x):=1/(2+x);u(n):=simplify((f@@n)(0));l:=sqrt(2)-1;
```

```
// Interprète f
// Succès lors de la compilation f
// Interprète u
Warning, une fonction algébrique définie par d'autres fonctions peut conduire à des e
Vous voulez dire peut être u:=unapply(simplify((f@@n)(0)),n)
// Attention: f, déclarée(s) comme variable(s) globale(s) lors de la compilation u
```

$$\left(x \to \frac{1}{2+x},\ n \to \text{simplify}(f@@n(0)),\ \sqrt{2}-1\right)$$

50
```
seq(approx(approx(l-u(n),200),4),n=10..150)
```

```
[ 1.073e-08, -1.84e-09, 3.158e-10, -5.418e-11, 9.296e-12, -1.595e-12, 2.736e-1
```

51

52 Prog Edit Ajoute 1 nxt Fonction Test Boucle OK Save

```
best(n):={
  local a,b,a0,b0,l,d,m;
  a0:=1;b0:=1;l:=sqrt(2)-1;
  d:=denom(u(n));m:=abs(a0/b0-l)
  for(b:=1;b<=d;b++){
    for(a:=1;a<b;a++){
      if(abs(a/b-l)<m){
        m:=abs(a/b-l);
        a0:=a;b0:=b;
        }
      }
    }
   return [a0,b0];
  }
```

```
(n)->
{ local a,b,a0,b0,l,d,m;
  a0:=1;
  b0:=1;
  l:=sqrt(2)-1;
  d:=denom(u(n));
  m:=abs(a0/b0-l);
  for (b:=1;b<=d;b++) for (a:=1;a<b;a++) if ((abs(a/b-l))<m) {
        m:=abs(a/b-l);
        a0:=a;
        b0:=b;
      }; ; ; ;
  return([a0,b0]);
 }
```

53
```
best(4);u(4)
```
$$([12,\ 29\ ],\ \frac{12}{29}\ )$$

54
```
best(5);u(5)
```
$$([29,\ 70\ ],\ \frac{29}{70}\ )$$

55
```
best(6);u(6)
```
$$([70,\ 169\ ],\ \frac{70}{169}\ )$$

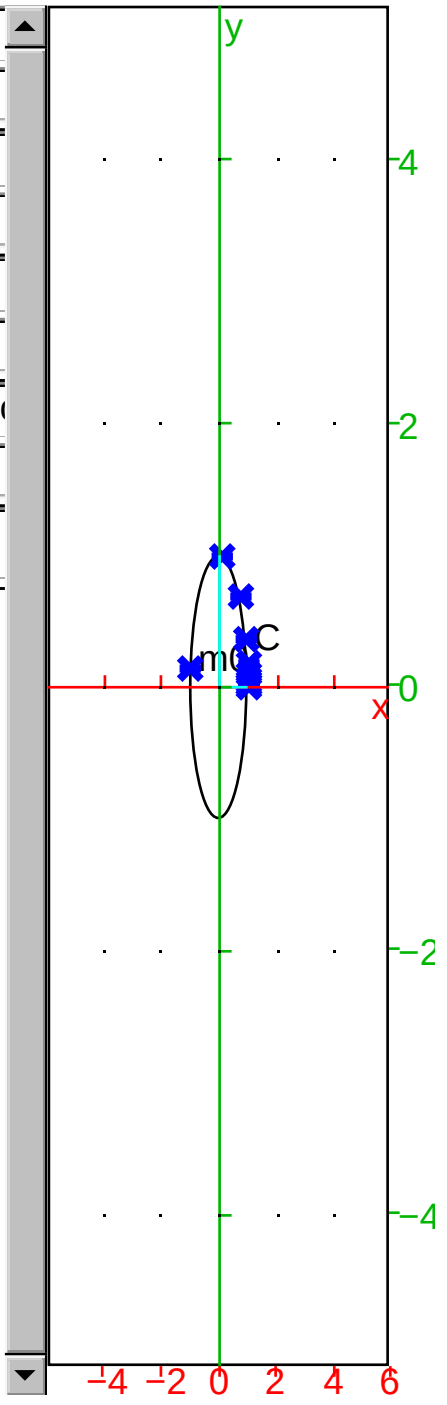
56
```
best(7);u(7) // Attention, le denominateur augmente tres tres vite.
```
Temps mis pour l'évaluation: 2.12

$$([169,\ 408\ ],\ \frac{169}{408}\ )$$

57 ——————————EXERCICE——————————

58 Fig Edit Graphe Repère Mode Sd Landscape

```
1 C:=cercle(0,1);
  cercle(point(0,0),1)
2 m0:=element(C,3);
  point(exp(3*i))
3 a:=affixe(m0);
  exp(3*i)
4 [seq(point((sqrt@@j)(a),affichage=bleu+epaisseur_p
  Done
5
```



59 EXERCICE

```
60 purge(a,b,c,d,e,t);
```

```
61 P:=((1-a*t)*(1-b*t)*(1-c*t)*(1-d*t))^(-1);
```

$$((-a*t+1)*(-b*t+1)*(-c*t+1)*(-d*t+1))^{-1}$$

```
62 s:=series(P,t=0,3);
```

$$t^3*(a^3+b^3+c^3+d^3+a*b^2+a*c^2+a*d^2+b*c^2+b*d^2+c*d^2+a^2*b+a^2*c+a^2*$$

63 On constate que le coefficient de t^n est la somme de tous les monomes de degre n en les 4 variables a,b,c,d. Ces monomes sont en bijections avec les suites croissantes (au sens large) de n \'el\'ements de {1,2,3,4}.

64
```
coeff(s,t^3);
```
3 , 3 3 , 3 , , 2 , 2 , , 2 , 2 , , 2 , , 2 2 , , 2 , , 2 , ,

65 Pour r\'esoudre ce Pb on met des poids aux variables. Ex: a,d de degre 1, b: 3, c: 2, et f: 4. et l'on cherche les monomes de degres 208.

66

undef

67
```
P:=1/((1-a*t)*(1-b*t^3)*(1-c*t^2)*(1-d*t)*(1-f*t^4));
```
$$\frac{1}{(-a*t+1)*(-b*t^3+1)*(-c*t^2+1)*(-d*t+1)*(-t^4*(x \to \frac{1}{2+x})+1)}$$

68
```
s:=series(P,t=0,4):;
```
"Développement en séries incorrect: Plusieurs args: à implementer

69
```
coeff(s,t^4); //Ex on verifie bien que f a un poids de 4
```
order_size(t)

70
```
P:=1/((1-t)*(1-t^3)*(1-t^2)*(1-t)*(1-t^4));
```
$$\frac{1}{(-t+1)^2*(-t^2+1)*(-t^3+1)*(-t^4+1)}$$

71
```
s:=series(P,t=0,208):;
```
Done

72
```
coeff(s,t^208);
```
3605967

73 Pour calculer le coefficient de t^n, seuls les termes en 1/(1-t^i) pour i<n+1 du produit vont contribuer, on n'a donc pas besoin du produit infini pour n fixe

74
```
P:=n->mul(1/(1-t^j),j=1..n);
```
// Attention: t,j, déclarée(s) comme variable(s) globale(s)
// End defining P

$$n \to \mathrm{mul}(\frac{1}{1-t^j}, j=(1 \,..\, n))$$

75 On cherche donc le coefficient de t^50 dans:

```
76 series(P(50),t,0,50);
```

$$1+t+2*t^{2}+3*t^{3}+5*t^{4}+7*t^{5}+11*t^{6}+15*t^{7}+22*t^{8}+30*t^{9}+42*t^{10}+56*t^{11}+$$
$$627*t^{20}+792*t^{21}+1002*t^{22}+1255*t^{23}+1575*t^{24}+1958*t^{25}+2436*t^{26}+3010$$
$$12310*t^{34}+14883*t^{35}+17977*t^{36}+21637*t^{37}+26015*t^{38}+31185*t^{39}+37338$$

```
77 coeff(series(P(50),t,0,50),t^50);
```

204226

```
78 l:=normal((a+b+c+d)^8);
```

$$a^{8}+b^{8}+c^{8}+d^{8}+8*a*b^{7}+8*a*c^{7}+8*a*d^{7}+8*b*c^{7}+8*b*d^{7}+8*c*d^{7}+28*a$$
$$70*a^{4}*c^{4}+70*a^{4}*d^{4}+56*a^{5}*b^{3}+56*a^{5}*c^{3}+56*a^{5}*d^{3}+28*a^{6}*b^{2}+28*a^{6}*c$$
$$56*b^{3}*d^{5}+70*b^{4}*c^{4}+70*b^{4}*d^{4}+56*b^{5}*c^{3}+56*b^{5}*d^{3}+28*b^{6}*c^{2}+28*b^{6}*$$
$$8*c^{7}*d+56*a*b*c^{6}+56*a*b*d^{6}+56*a*c*d^{6}+168*a*b^{2}*c^{5}+168*a*b^{2}*d^{5}+$$
$$168*a*b^{5}*d^{2}+56*a*b^{6}*c+56*a*b^{6}*d+168*a*c^{2}*d^{5}+280*a*c^{3}*d^{4}+280*a$$
$$280*b*c^{4}*d^{3}+168*b*c^{5}*d^{2}+56*b*c^{6}*d+168*a^{2}*b*c^{5}+168*a^{2}*b*d^{5}+168$$
$$420*a^{2}*b^{4}*c^{2}+420*a^{2}*b^{4}*d^{2}+168*a^{2}*b^{5}*c+168*a^{2}*b^{5}*d+420*a^{2}*c^{2}*d^{4}$$
$$280*a^{3}*c*d^{4}+560*a^{3}*b^{2}*c^{3}+560*a^{3}*b^{2}*d^{3}+560*a^{3}*b^{3}*c^{2}+560*a^{3}*b^{3}*d$$
$$280*a^{4}*b*c^{3}+280*a^{4}*b*d^{3}+280*a^{4}*c*d^{3}+420*a^{4}*b^{2}*c^{2}+420*a^{4}*b^{2}*d^{2}+$$
$$168*a^{5}*b*d^{2}+168*a^{5}*c*d^{2}+168*a^{5}*b^{2}*c+168*a^{5}*b^{2}*d+168*a^{5}*c^{2}*d+5$$
$$420*b^{2}*c^{4}*d^{2}+168*b^{2}*c^{5}*d+280*b^{3}*c*d^{4}+560*b^{3}*c^{2}*d^{3}+560*b^{3}*c^{3}*d$$

```
79 coeff(l,[a,b,c,d],[3,2,1,2]);
```

1680

```
80 binomial(8,3)*binomial(5,2)*binomial(3,1);
```

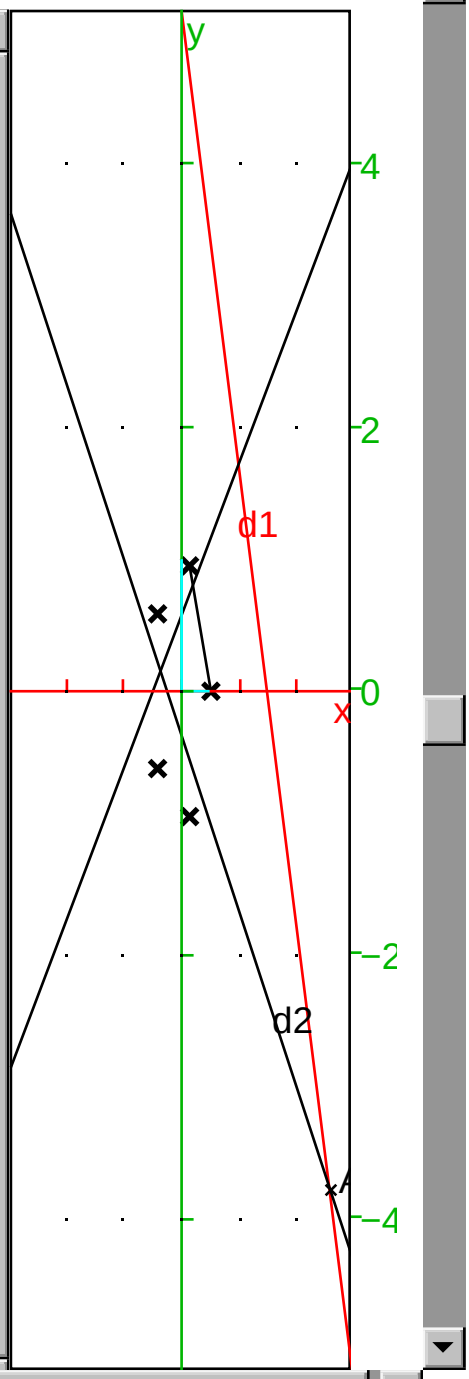
1680

```
81 ----------EXERCICE----------
```

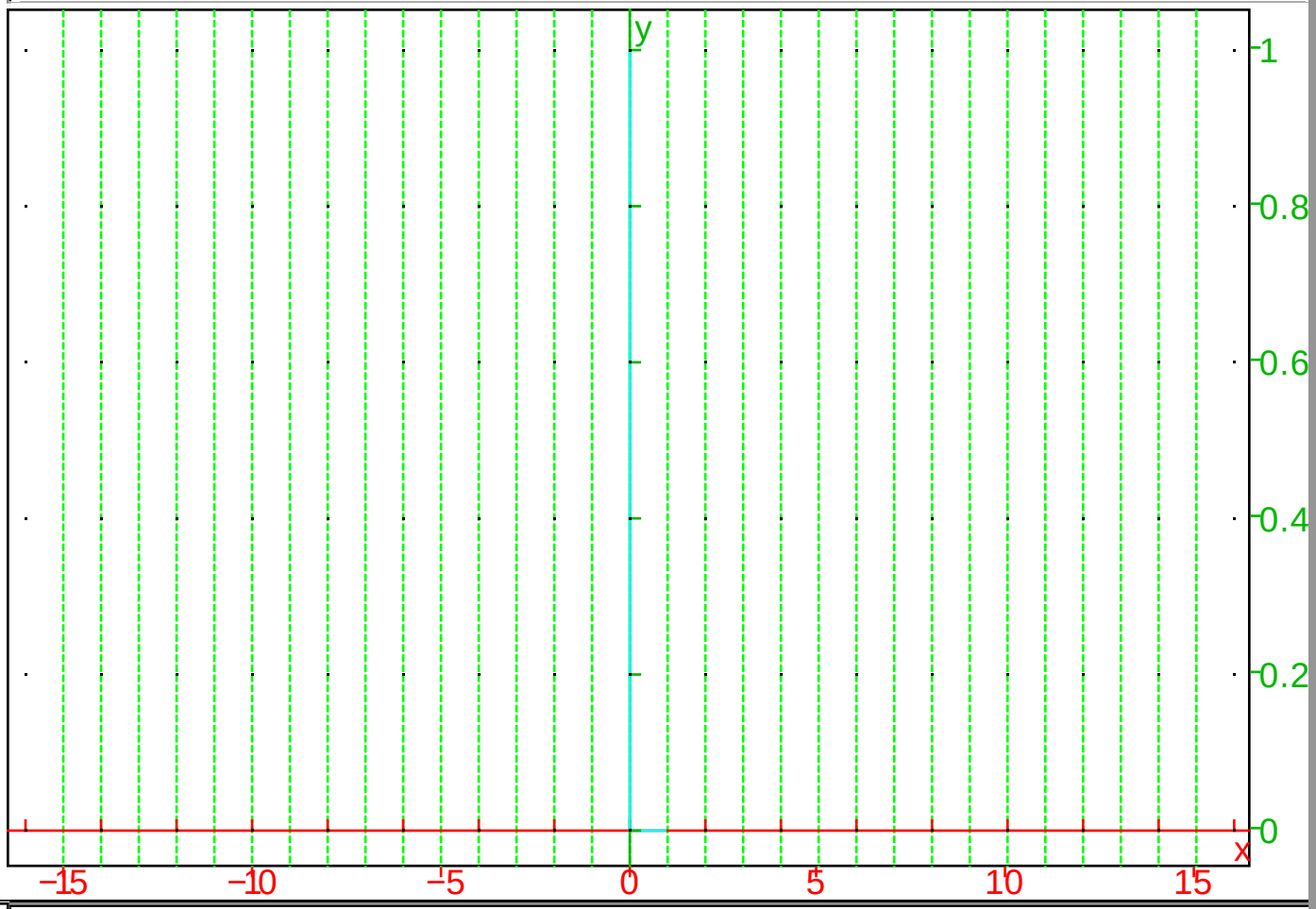
```
82 Pour supprimer/modifier, il suffit de supprimer/editer la ligne correspondante
```

83 Fig Edit Graphe Repère Mode Sl Landscape

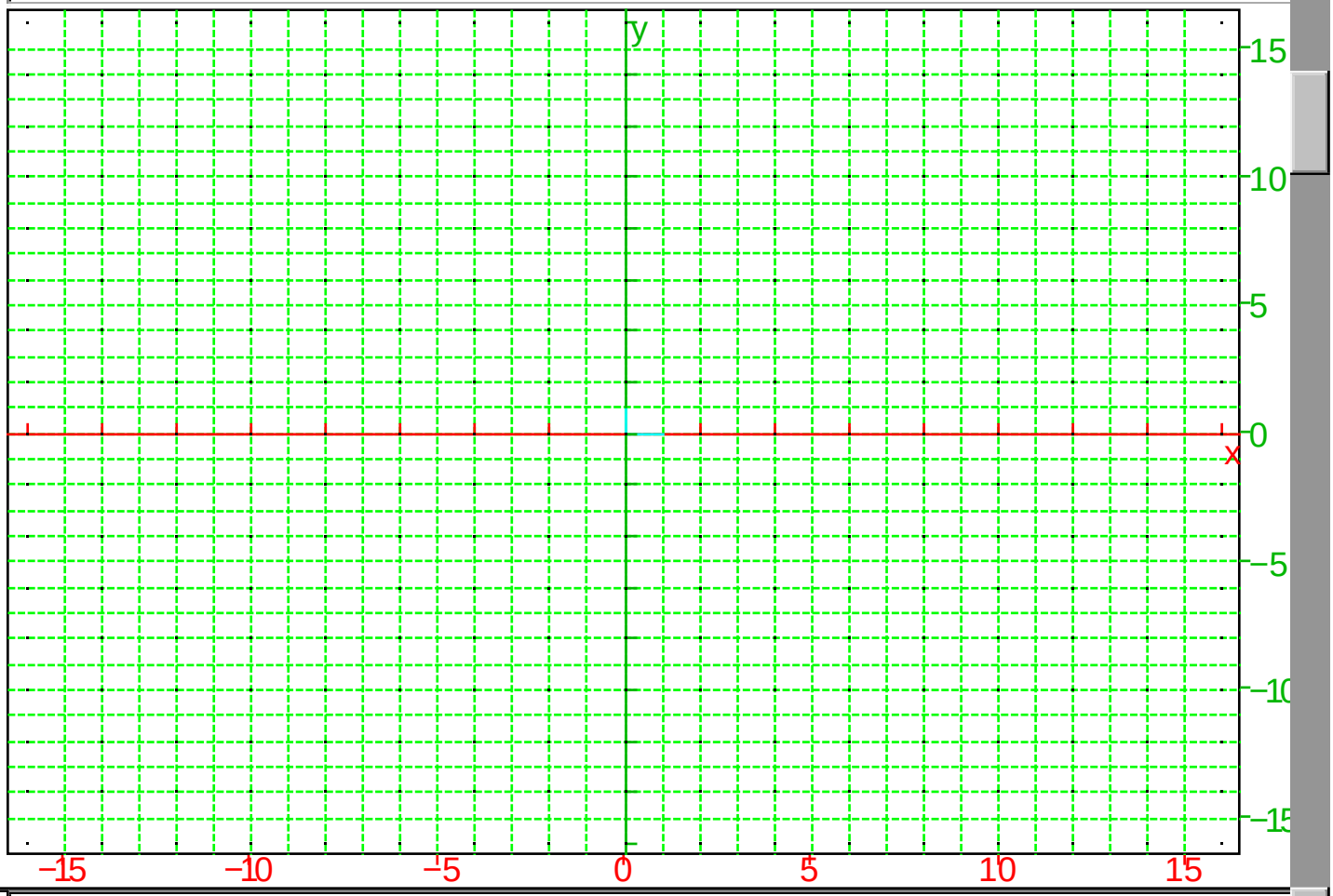
```
1  n:=5;
   5
2  zs:=exp(2*i*Pi/n);
   ((i)*sqrt(2*sqrt(5)+10))/4+(sqrt(5)−1)/4
3  [seq(point(zs^j,affichage=point_width_2),j=0..4)];
   Done
4  segment(point(1),point(zs));//un cote du pentagone
   segment(point(1,0),point((sqrt(5)−1)/4+((i)*sqrt(2*s
5  d1:=droite(point(3),point(3+exp(2*i*Pi/3)),'affichage
   droite(y=(−sqrt(3)*x+3*sqrt(3)))
6  d2:=droite(2*x+3*y+1=0);
   droite(y=((−2*x)/3−1/3))
7  A:=inter(d1,d2);
   [point(((21−14*i)*sqrt(3)+83−63*i)/23)]
8  t:=element(−5..3);
   parameter([t,−5,3,−1,0.08])
9  perpendiculaire(point(t),d1);
   droite(y=((sqrt(3)*x)/3+(sqrt(3))/3))
10
```



84 `l1:=[seq(droite(x=k,display=vert+ligne_tiret),k=-15..15)];`

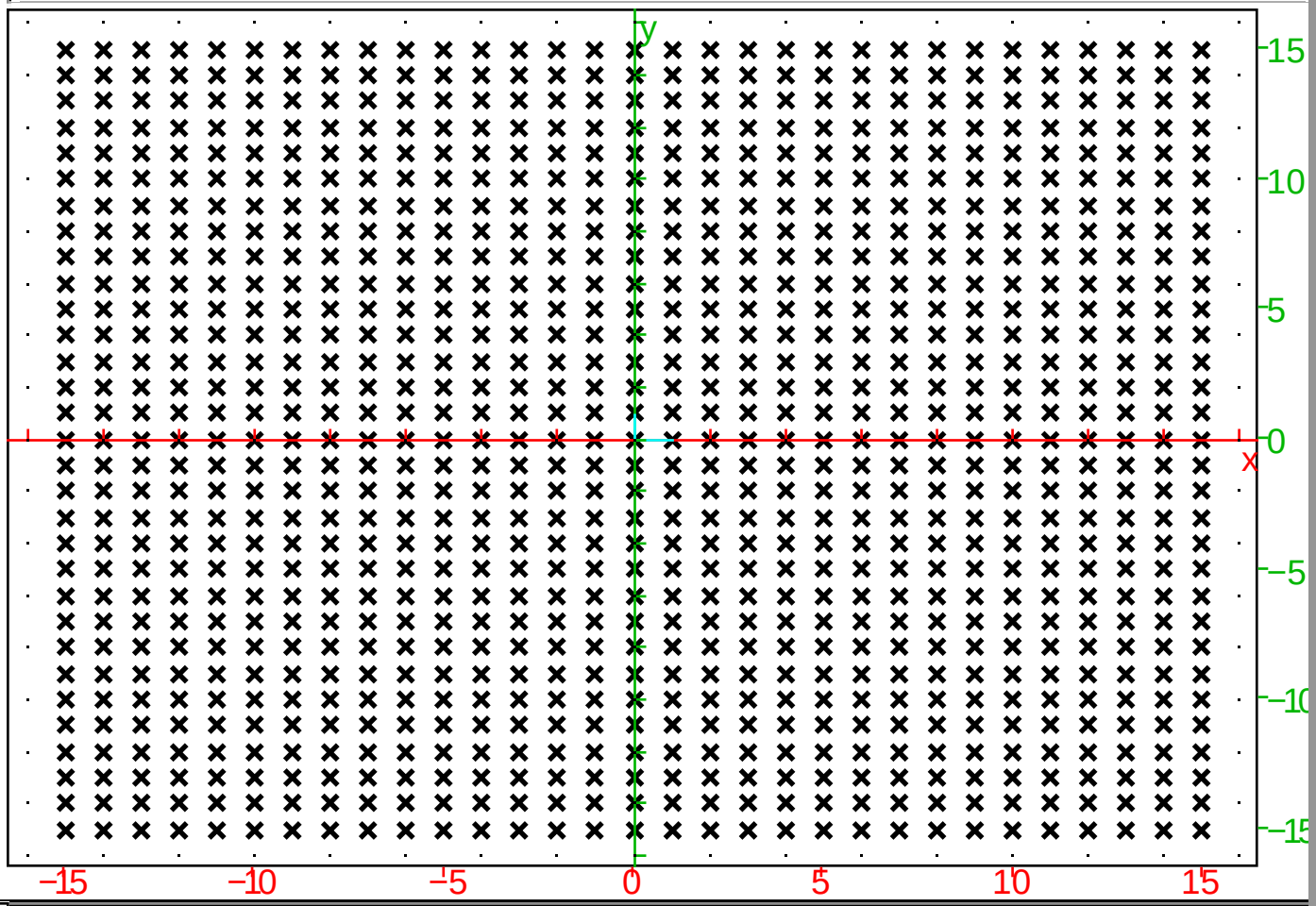


85 `ZI:=[l1,l1*i];`



86 Pour ne pas afficher les nom, le plus simple est d'aller dans le menu cfg \'a droite.

87 `Gentiers:=inter(l1,i*l1,display=epaisseur_point_2+hidden_name);`



88

89 Fig Edit Graphe Repère Mode Standard

1 `ZI;`

Done

2 `p:=point(1+2*i,affichage=bleu+epaisseur_point_3);`

point(1,2)

3 `a:=affixe(p);`

1+2*i

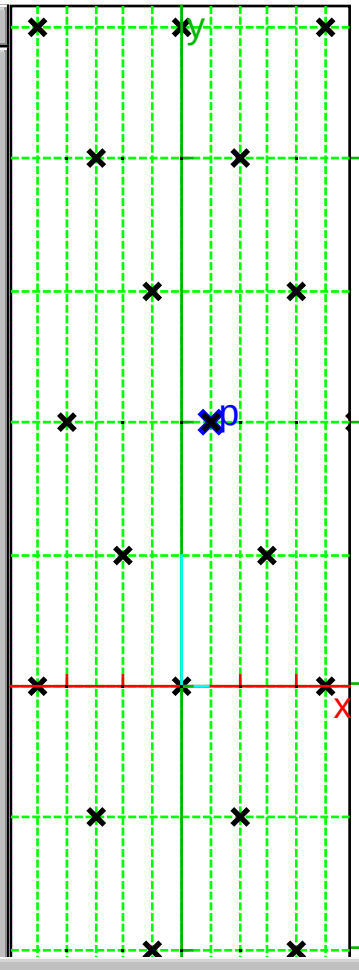
4 `Gentiers*a;`

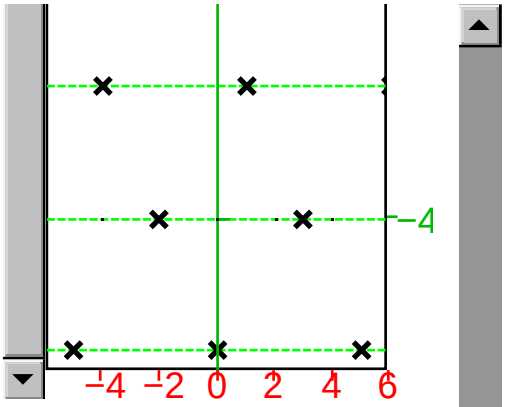
Done

5 `cercle(10+7*i,abs(a));`

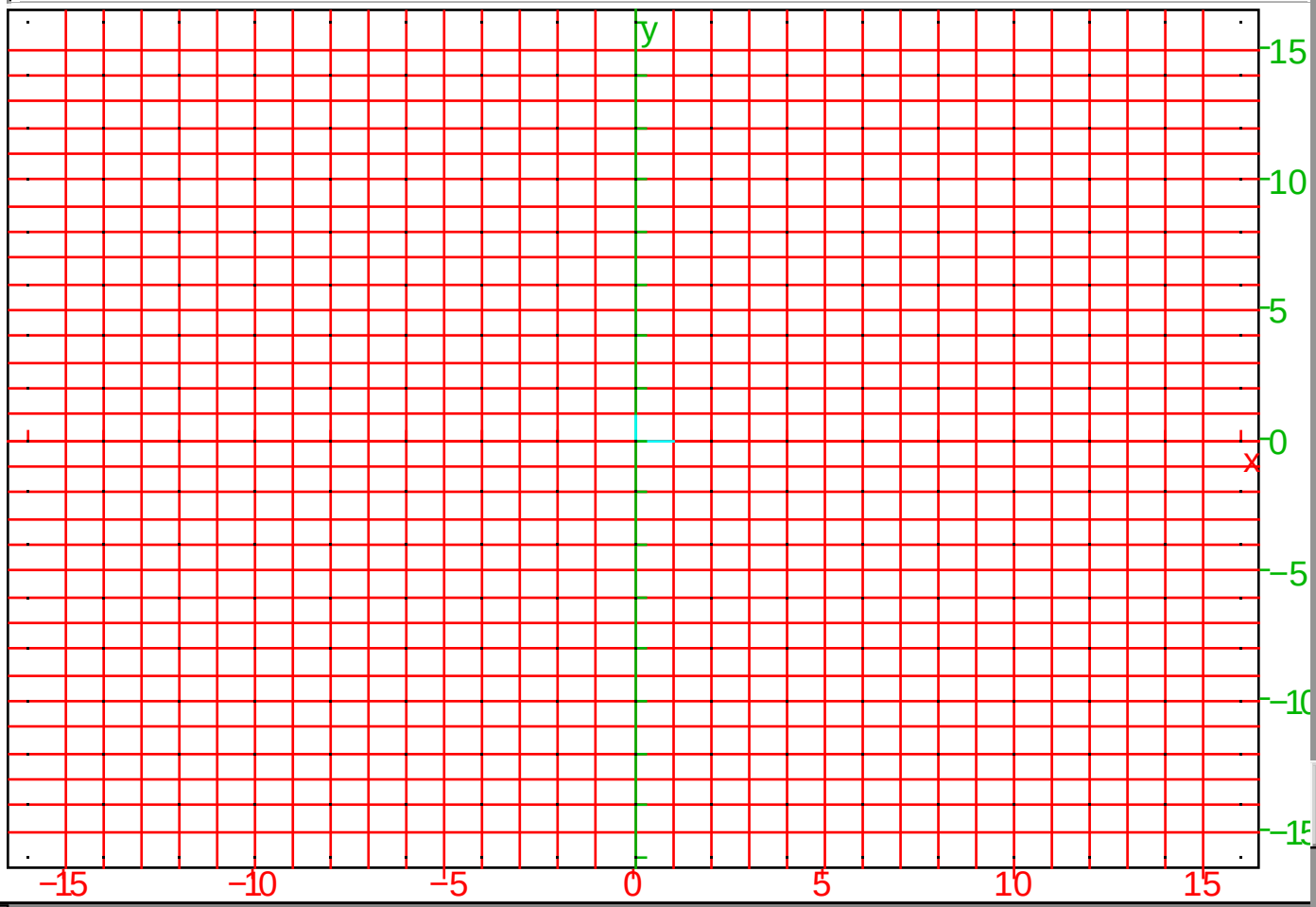
cercle(point(10,7),sqrt(5))

6





90
```
color(ZI,rouge);
```



91
```
EXERCICE
```

92
```
purge(a);
```
1+2*i

93
```
trigexpand(cos(5*a));
```
$16*\cos(a)^5-20*\cos(a)^3+5*\cos(a)$

94
```
normal(int(cos(5*x)/(2+sin(x)),x=0..Pi/2));//simplify ne marche pas?
```
$\frac{254}{209*\ln(2)+209*\ln(2)}$

95
```
P:=int(cos(5*x)/(2+sin(x)),x);
```

$$2*(\frac{209*\ln(\sin(x)+2)}{\quad} + \frac{32*\sin(x)^4 - \frac{256*\sin(x)^3}{3} + 208*\sin(x)^2 - 832*\sin(x)}{\quad}$$

96 La forme developpee avant l'integration est plus simple:

97
```
P:=int(trigexpand(cos(5*x)/(2+sin(x))),x);
```

$$5*\ln(\sin(x)+2) - 20*(\frac{\sin(x)^2}{\quad} - 3*\ln(\sin(x)+2) + 2*\sin(x)) + 16*(\frac{\sin(x)^4}{\quad} - 2*s$$

98
```
simplify(diff(P,x)-cos(5*x)/(2+sin(x))); //NB: normal ne suffit pas.
```

$$0$$

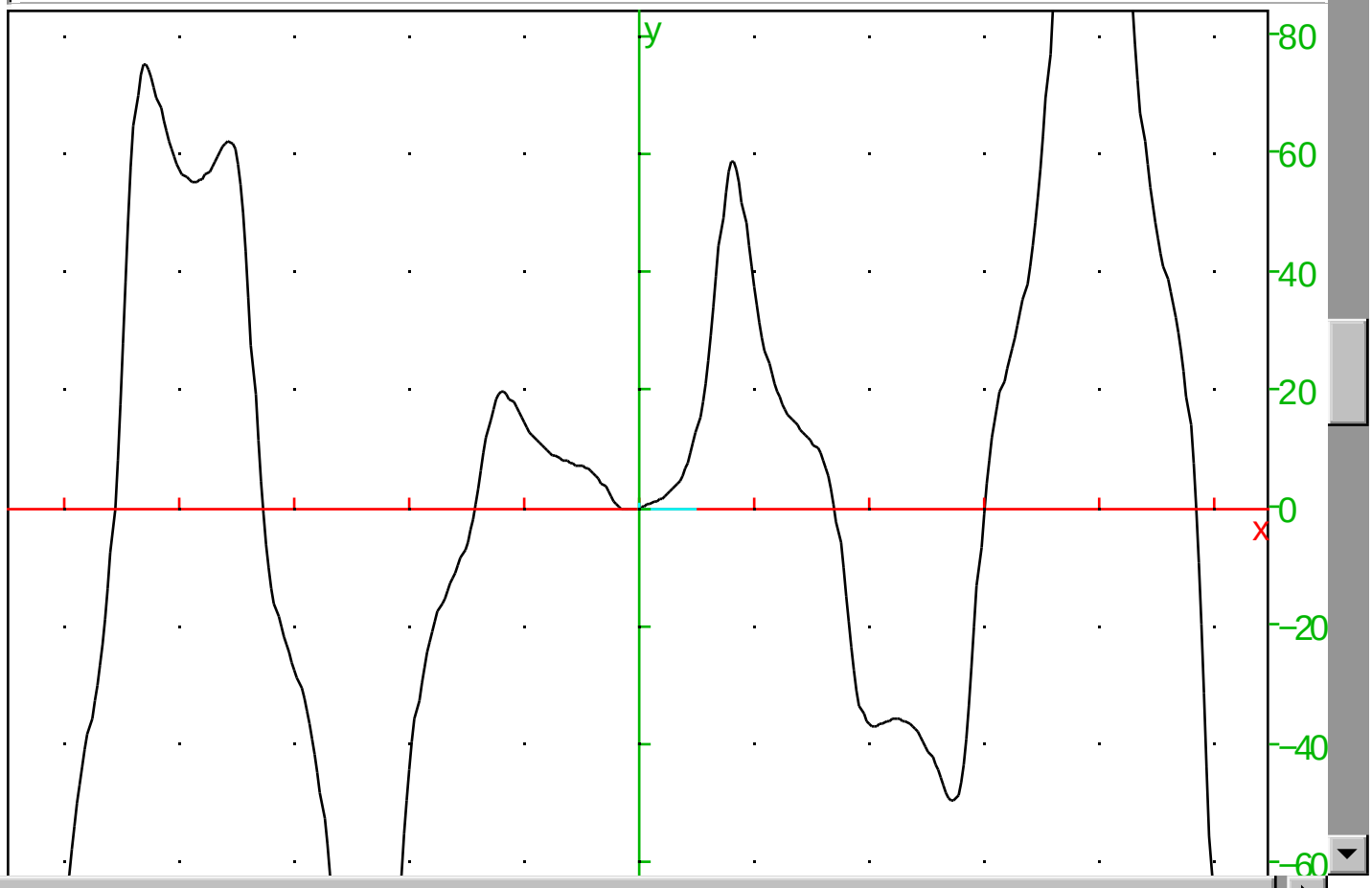
99 EXERCICE

100 La decomposition en elements simples introduit une extension de corps. (Que le logiciel ne pourra pas toujours trouver)

101
```
I1:=int(cos(5*x)/(2+sin(3*x)));
```

$$-2*\sin(x)^2 + -2*x + \int \frac{(\tan(\frac{x}{2})^2 + 1)*(160*\tan(\frac{x}{2})^4 + 896*\tan(\frac{x}{2})^3 + 448*}{32*(\tan(\frac{x}{2})^6 + 3*\tan(\frac{x}{2})^5 + 3*\tan(\frac{x}{2})^4 - 10*\tan(\frac{x}{2})}$$

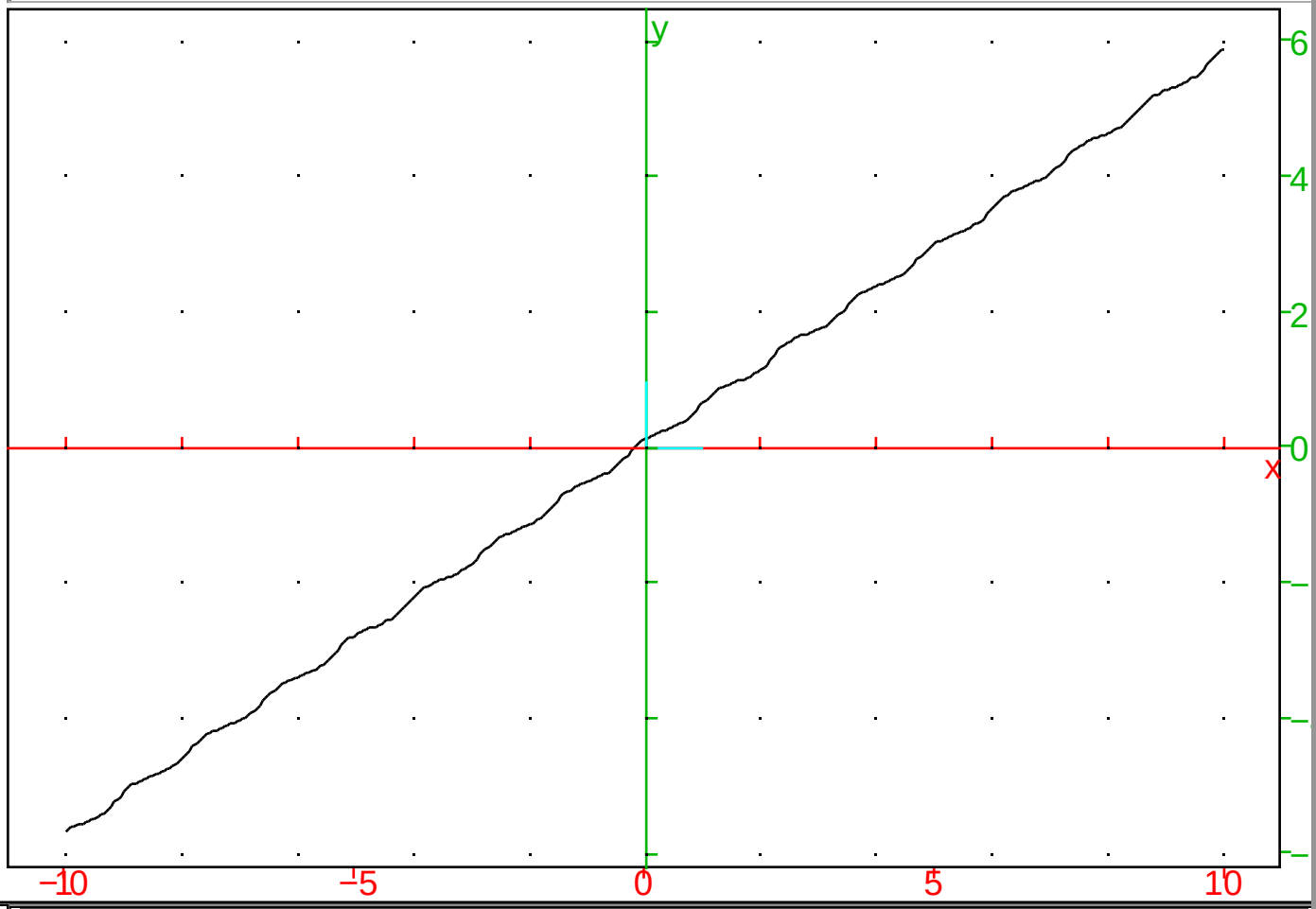
102
```
plot(I1);
```



103 I2:=int(1/(2+sin(5*x))); // Attention a la partie entiere sinon ca n'es

$$2*\frac{1}{\sqrt{3}}*\frac{1}{5}*\left(\operatorname{atan}\left(\frac{2*\tan\left(\frac{5*x}{2}\right)+1}{\sqrt{3}}\right)+\pi*\operatorname{floor}\left(\frac{1}{2}+\frac{5*x}{2*\pi}\right)\right)$$

104
```
plot(I2);
```



105
```
P1:=(x^2-1)/(x-1);
```

$$\frac{x^2-1}{x-1}$$

106
```
expand(P1);//developpe dans Q(x)
```

$$\frac{x^2}{x-1}-\frac{1}{x-1}$$

107
```
normal(P1),simplify(P1);//les 2 simplifient
```

$$(x+1,\ x+1\ )$$

108
```
P2:=-cos(5*x)+16*cos(x)*sin(x)^4-12*cos(x)*sin(x)^2+cos(x);
```

$$\cos(x)-\cos(5*x)-12*\cos(x)*\sin(x)^2+16*\cos(x)*\sin(x)^4$$

109
```
expand(P2);
```

110
```
normal(P2);
```
$$-\cos(5*x)+16*\cos(x)*\sin(x)^4-12*\cos(x)*\sin(x)^2+\cos(x)$$

111
```
simplify(P2);
```
$$0$$

112
```
factor(X^12-1);
```
$$(X-1)*(X+1)*(X^2+1)*(X^2-X+1)*(X^2+X+1)*(X^4-X^2+1)$$

113 phi12 est le facteur qui n'apparait pas dans:

114
```
factor(X^6-1);factor(X^4-1);
```
$$((X-1)*(X+1)*(X^2-X+1)*(X^2+X+1),\ (X-1)*(X+1)*(X^2+1))$$

115
```
P:=(2*x+1)^2*(x^5-1)/(x-1);
```
$$\frac{(x^5-1)*(2*x+1)^2}{x-1}$$

116
```
complex_mode:=1;factor(P*1.1);factor(approx(P));
```
$$4.4*(x+0.8090169944+0.5877852523*i)*(x+0.8090169944-0.5877852523*i)*(x+-0.3090169944+0.9510565163*i)*(x+-0.3090169944-0.9510565163*i)*(x+0.5+7.227651959e-08*i)*(x+0.5-7.$$
$$1,\ (x+-0.3090169944-0.9510565163*i)*(x+0.5+7.227651959e-08*i)*(x+0.5-7.$$

117
```
complex_mode:=0;factor(P*1.0);factor(approx(P,5));factor(P);
```


118 On peut factoriser en imposant une extension algebrique avec une syntaxe comme dans maple.
Mais je ne le trouve pas dans la doc (c'est rare). Exemples:

119
```
factor(X^12-1,sqrt(3));
```


120
```
factor(X^12-1,[sqrt(3),i]);
```
$$(X-1)*(X+1)*(X+i)*(X+-i)*(X^2-X+1)*(X^2+X+1)*(X^2+i*X-1)*(X^2+(-i)*X-1$$

121
```
factor(X^12-1,exp(2*i*Pi/9));
```
$$(X-1)*(X+1)*(X^2+1)*(X^2-X+1)*(X^2+X+1)*(X^4-X^2+1)*\exp(\frac{2*i*\pi}{9})$$

122 selon les versions, cFactor(...,a) est plus sur si l'on veut etre sur que i a ete utilise. (

123
```
cFactor(X^12-1,sqrt(3));//est probablement plus sur
```


124 ——————————EXERCICE——————————

125
```
purge(a,u,v);
```
(No such variable a, n ->simplify(f@@n(0)), No such variable v)

126
```
b:=a+u;c:=b+v;//on ordonne a,b,c
```
$(a+u,\ a+u+v)$

127
```
F:=a/(b+c)+b/(a+c)+c/(a+b)-3/2;
```
$$-\frac{3}{2}+\frac{a}{a+u+a+u+v}+\frac{a+u}{a+u+v+a}+\frac{a+u+v}{a+u+a}$$

128 le numerateur et le denominateur n'ont que des coefficients positifs, donc F>0 pour 0<a, 0<u , 0<v

129
```
numer(F);
```
$2*u^3+2*v^3+4*a*u^2+4*a*v^2+5*u*v^2+3*u^2*v+4*a*u*v$

130
```
denom(F);
```
$3+3+2+2+2+2+2+2$

131 ——————————EXERCICE——————————

132 Prog Edit Ajoute | 1 | nxt Fonctior | Test | Boucle | OK | Save |

```
quodicho(a,b):={
  local n,aa,bb,g;
  n:=0;aa:=1;bb:=1;
  while((b*2^n) <= a){
    n:=n+1;
  }
  aa:=2^(n-1);bb:=2^n;
  for(k:=1;k<n;k++){
    g:=iquo(aa+bb,2);
    if(g*b<=a){ aa:=g;}
```

Interprète quodicho
Attention: k, déclarée(s) comme variable(s) globale(s) lors de la compilation quodicho

Done

133
```
quodicho(127,33)==iquo(127,33);// doit etre vrai
```
vrai

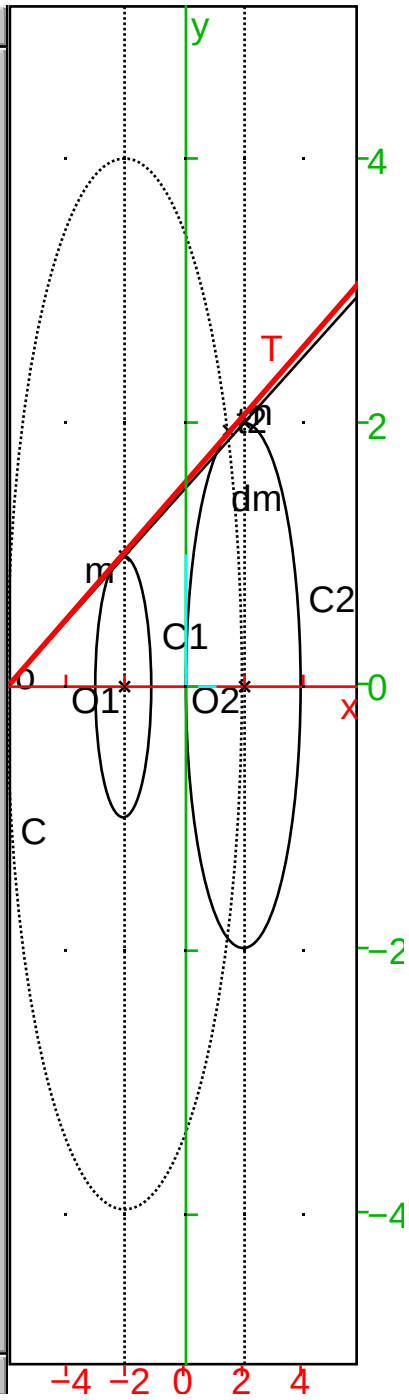
134

135 ——————————EXERCICE——————————

136 Stategie: On cherche le centre o d'une homothetie transformant C1 en C2, en suite on recupere le point de contact en exprimant qu'il est le sommet d'un triange rectable de base [oO2]. Attention, inter rend un objet de type groupe de points, meme s'il y a unicite, pour choisir un point dans l'intersection on utilise inter_unique

137 Fig Edit Graphe Repère Mode St Landscape

```
1  O1:=point(−2);O2:=point(2);r1:=1;
   pnt(pnt[−2,536870968,"O1"]),pnt(pnt[2,536870968
2  r2:=element(1.2..5,2);//Attention a ne pas faire de ce
   parameter([r2,1.2,5,2,0.038])
3  C1:=cercle(O1,r1);
   cercle(point(−2,0),1)
4  C2:=cercle(O2,r2);
   cercle(point(2,0),2)
5  m:=point(O1+i);droite(O1,m,affichage=dot_line);//ur
   [point(−2,1),droite(x=−2)]
6  dm:=parallele(O2,droite(O1,m),affichage=dot_line);
   droite(x=2)
7  n:=inter_unique(dm,C2);
   point(2,2)
8  droite(m,n);o:=inter_unique(droite(m,n),droite(O1,C
   [droite(y=(x/4+3/2)),point(−6,0)]
9  C:=cercle(O2,o,affichage=dot_line);t2:=inter_unique
   [cercle(point(−2,0),4),point(((i)*sqrt(15)+3)/2)]
10 T:=droite(o,t2,affichage=(rouge+line_width_2));
   droite(y=((sqrt(15)*x)/15+(2*sqrt(15))/5))
11
```



138