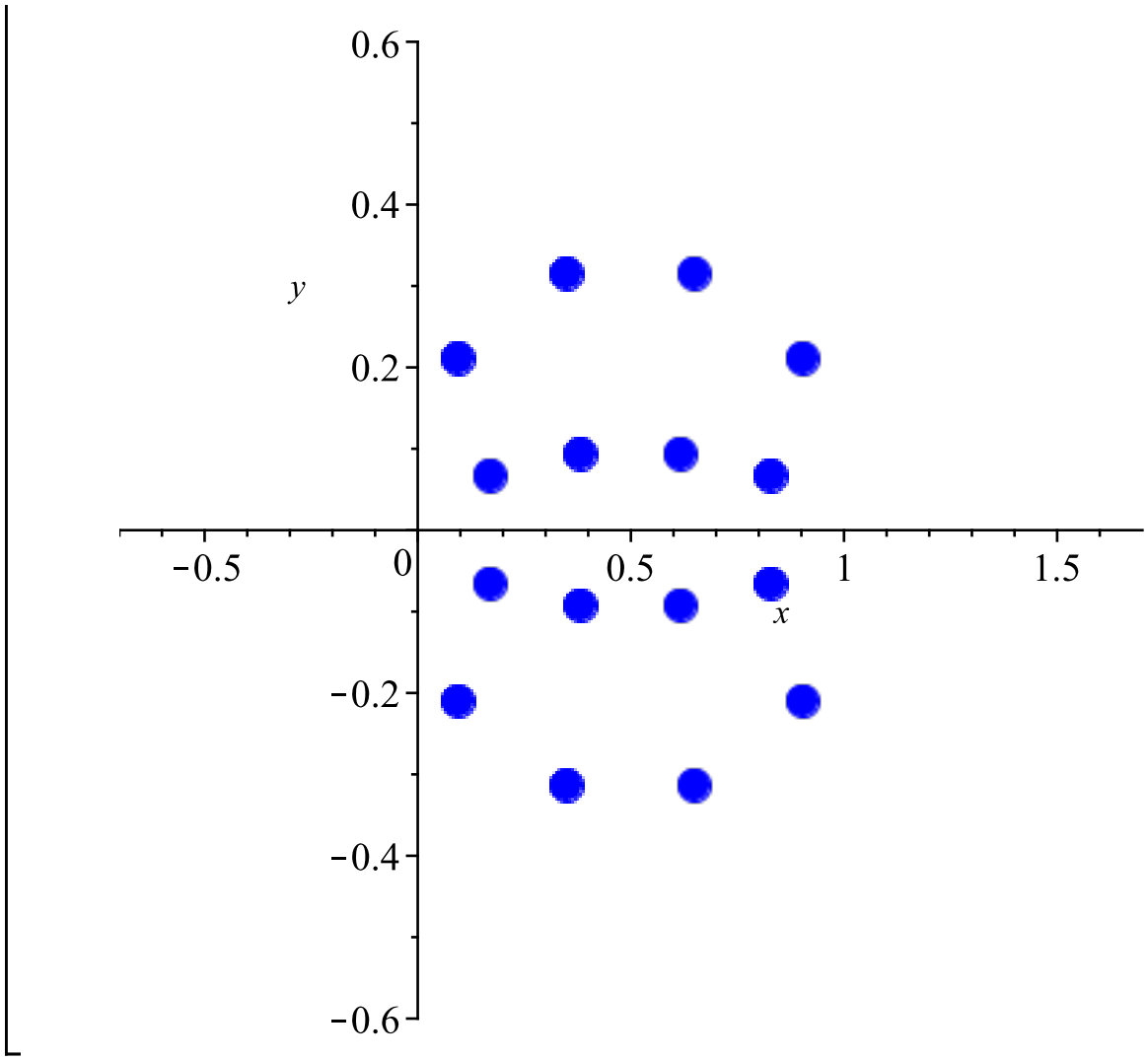
```
> restart;alias(sigma=sigma(x),phi=phi(x),psi=psi(z)):with
  (PDEtools):with(plots):with(LinearAlgebra):with(linalg):
> S6:=diff(sigma,x)*(x*(x-1)*diff(sigma,x,x))^2+(diff(sigma,x)*(2*
  sigma-(2*x-1)*diff(sigma,x))+nu[1]*nu[2]*nu[3]*nu[4])^2-product
  (diff(sigma,x)+nu[k]^2,k=1..4):
> a:=-4;b:=-13;c:=-8;n:=4;
```

$$a := -4$$
$$b := -13$$
$$c := -8$$
$$n := 4 \tag{1}$$

```
> phi:=simplify(expand(sort(hypergeom([a,b], [c], x))))*x^(b):
> phi:for K from 1 to n do;l[K]:=diff(%,x)*x*(x-1);od:wronskian(
  [phi,seq(l[k],k=1..n-1)],x):for K from 1 to n do;h[K]:=Row(%,1);
  row(%%,2);wronskian(%*x*(x-1),x):od:simplify(<seq(simplify(h[k]),
  k=1..n)>):tau:=factor(expand(det(%))*x^((1-n-2*b)*n/2)*(x-1)^((1-
  n)*(n/2)));
```

$$\tau := \frac{14632310742192}{343}x^{16} - \frac{117058485937536}{343}x^{15} + \frac{8868067116480}{7}x^{14} \tag{2}$$
$$- \frac{1418890738636 80}{49}x^{13} + \frac{1564361147297520}{343}x^{12} - \frac{1800422272348128}{343}x^{11}$$
$$+ \frac{1566783845353584}{343}x^{10} - \frac{21477673039680}{7}x^{9} + \frac{78873343443180}{49}x^{8}$$
$$- \frac{32490406737360}{49}x^{7} + \frac{10505765525112}{49}x^{6} - \frac{18549557172432}{343}x^{5}$$
$$+ \frac{3598208679780}{343}x^{4} - \frac{522111601440}{343}x^{3} + 156602160\,x^{2} - \frac{501126912}{49}x$$
$$+ \frac{15660216}{49}$$

```
> RootOf(tau,x):A:=evalf(allvalues(%)):
> complexplot([A],x=-0.7..1.7,y=-0.6..0.6,style=point,symbol=
  solidcircle,color=blue,symbolsize=25);
```


0.6
0.4
y
0.2
-0.5
0
0.5
1
1.5
x
-0.2
-0.4
-0.6