```
> restart;with(PDEtools):with(linalg):with(LinearAlgebra):with
  (plots):
> p[-1]:=0;p[0]:=1;p[1]:=x;
```

$$p_{-1} := 0$$

$$p_0 := 1$$

$$p_1 := x \qquad\qquad (1)$$

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> alpha:=1;beta:=1;
```

$$\alpha := 1$$

$$\beta := 1 \qquad\qquad (2)$$

```
> J:=sort(simplify(GAMMA(alpha+1)*(-1)^beta*beta!*LaguerreL(beta,-
  alpha-beta-1,z))):
> tau:=(n)->factor(collect(subs(det(Wronskian([J/z^(alpha+beta+1),
  seq(diff(J/z^(alpha+beta+1),z$j),j=1..n-1)],z))),z,factor)):
> Delta:=(n)->tau(n)*z^(n*(alpha+beta+n)):Deltahat:=(n)->-diff(tau
  (n),z)*z^(n*(alpha+beta+n)+1):
> a:=(n)->convert(simplify(Deltahat(n+1)/Delta(n+1)-Deltahat(n)
  /Delta(n)),parfrac,z);b:=(n)->simplify(Delta(n+1)*Delta(n-1)
  /Delta(n)^2);
```

$$a := n \rightarrow convert\left(simplify\left(\frac{Deltahat(1+n)}{\Delta(1+n)} - \frac{Deltahat(n)}{\Delta(n)} \right), parfrac, z \right)$$

$$b := n \rightarrow simplify\left(\frac{\Delta(1+n)\,\Delta(n-1)}{\Delta(n)^2} \right) \qquad\qquad (3)$$

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> N:=6;
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$$N := 6 \qquad\qquad (4)$$

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> for n from 1 to N do; p[n+1]:=collect(x*p[n]-a(n)*p[n]-b(n)*p
  [n-1],[z,x],factor);od:
> z:=-1;plot({seq(p[j]/j^5,j=2..N+1)},x=-10..20,y=-2..4,thickness=
  3);
```

$$z := -1$$