gfun[`rec+rec`] - termwise sum of two holonomic recurrences

gfun[`rec*rec`] - termwise product of two holonomic recurrences

gfun[cauchyproduct] - Cauchy product of two holonomic recurrences

Calling Sequence

`rec+rec`(**rec1**, **rec2**, **u(n)**)

`rec*rec`(**rec1**, **rec2**, **u(n)**)

cauchyproduct(**rec1**, **rec2**, **u(n)**)

Parameters

`rec1, rec2` - two linear recurrences with polynomial coefficients

`u, n` - variable and index of the recurrence

Description

- If **a(n)** and **b(n)** are the sequences defined respectively by **rec1** and **rec2**, **gfun[`rec+rec`]** outputs a recurrence for **a(n)+b(n)**, **gfun[`rec*rec`]** outputs a recurrence for **a(n)*b(n)**, and **gfun[cauchyproduct]** outputs a recurrence for their Cauchy product or convolution **c(n) = sum(a(i)*b(n-i),i=0..n).**

Examples

```
> with(gfun):
  rec1:=u(n+1)=(n+1)*u(n):
  rec2 := u(n+1)=2*u(n):
  `rec+rec`(rec1,rec2,u(n));
```

$$\{(2n^2+2n)\,u(n)+(-n^2-3n+2)\,u(n+1)+(n-1)\,u(n+2), u(0)=\_C_0, u(1) = \_C_1, u(2)=2\,\_C_1, u(3)=4\,\_C_0+2\,\_C_1\} \quad (2.1)$$

```
> `rec*rec`(rec1,rec2,u(n));
```

$$(-2n-2)\,u(n)+u(n+1) \quad (2.2)$$

```
> cauchyproduct(rec1,rec2,u(n));
```

$$\{(2n+4)\,u(n)+(-4-n)\,u(n+1)+u(n+2), u(0)=\_C_0, u(1)=3\,\_C_0\} \quad (2.3)$$

See Also

gfun, gfun[parameters], gfun[diffeq+diffeq], gfun[diffeq*diffeq], gfun[hadamardproduct]