

REDUCE 708:]load zeilberg;clear(g);on zb_trace;clear aa,l,i,k,u,aa1,aasq,aat,bb;

REDUCE 712:]aa:=pochhammer(a,i)*factorial(u)*binomial(u,i)*y^(u)/pochhammer(b,u);

$$aa: = \frac{y^u \binom{u}{i} u! \text{pochhammer}(a, i)}{\text{pochhammer}(b, u)}$$

REDUCE 713:]aai:=sumrecursion(aa,i,u);

$$F(u, i) / F(u - 1, i) = \frac{-u^2 y}{(u - 1 + b)(i - u)}$$

REDUCE 713:]solve((u^2+2*u+2)*a-(u+1)^2);solve((u+1)*a-u,u)

$$F(u, i) / F(u, i - 1) = -(i - 1 + a)(u + 1 - i) i$$

Zeilberger algorithm applicable

applying Zeilberger algorithm for order: =1

$$p: = \text{zb_sigma}(1) b i - \text{zb_sigma}(1) b u + \text{zb_sigma}(1) i u - \text{zb_sigma}(1) i - \text{zb_sigma}(1) u^2 + \text{zb_sigma}(1) u - u^2 y$$

$$q: = -a i u - a i - a + i u + u + 2$$

$$r: = 1$$

$$\text{degreebound} := 0$$

$$f: = \frac{u^2 y}{a u^2 + 2 a u + 2 a - u^2 - 2 u - 1}$$

$$p: = \frac{u^2 y (-a i u - a i - a u - 2 a + i u + 2 u + 1)}{a u^2 + 2 a u + 2 a - u^2 - 2 u - 1}$$

Zeilberger algorithm successful

$$aai: = ((u^2 + 2 u + 2) a - (u + 1)^2) (u - 1 + b) \text{summ}(u) - ((u + 1) a - u) \text{summ}(u - 1) u^2 y$$

REDUCE 716:]aac:=(-a^2+a)/(a-1)^2;

$$aac: = \frac{-a}{a - 1}$$

REDUCE 717:]aad:=pochhammer(aasq^2-1,u)*pochhammer(b,u)/(pochhammer(aasq,u)*pochhammer(aasq,u))

$$aad: = \frac{\text{pochhammer}(aasq^2 - 1, u) \text{pochhammer}(b, u)}{\text{pochhammer}(aasq, u)^2}$$

REDUCE 718:]aat:=(1)*(x^k)*y^u*binomial(k,u)*aad;

$$aat: = \frac{y^u x^k \binom{k}{u} \text{pochhammer}(aasq^2 - 1, u) \text{pochhammer}(b, u)}{\text{pochhammer}(aasq, u)^2}$$

REDUCE 719:]clear bb;bb:=sumrecursion(aat,u,k);

$$F(k, u) / F(k - 1, u) = \frac{k x}{k - u}$$

$$F(k, u) / F(k, u - 1) = \frac{-(u - 1 + b)(u - 1 - k)(u - 2 + aasq^2) y}{(u - 1 + aasq)^2 u}$$

Zeilberger algorithm applicable

applying Zeilberger algorithm for order: =1

$p := \text{zb_sigma}(1) k - \text{zb_sigma}(1) u + k x$

$q := y$

$(\text{aasq}^2 b k - \text{aasq}^2 b u + \text{aasq}^2 b + \text{aasq}^2 k u - \text{aasq}^2 k - \text{aasq}^2 u^2 + 2 \text{aasq}^2 u - \text{aasq}^2 + b k u - 2 b k - b u^2 + 3 b u$

$- 2 b + k u^2 - 3 k u + 2 k - u^3 + 4 u^2 - 5 u + 2)$

$r := u (\text{aasq}^2 + 2 \text{aasq} u - 2 \text{aasq} + u^2 - 2 u + 1)$

degreebound: =0

applying Zeilberger algorithm for order: =2

$p := \text{zb_sigma}(2) k^2 - 2 \text{zb_sigma}(2) k u - \text{zb_sigma}(2) k + \text{zb_sigma}(2) u^2 + \text{zb_sigma}(2) u +$

$\text{zb_sigma}(1) k^2 x - \text{zb_sigma}(1) k u x - \text{zb_sigma}(1) k x + \text{zb_sigma}(1) u x + k^2 x^2 - k x^2$

$q := y$

$(\text{aasq}^2 b k - \text{aasq}^2 b u + \text{aasq}^2 b + \text{aasq}^2 k u - \text{aasq}^2 k - \text{aasq}^2 u^2 + 2 \text{aasq}^2 u - \text{aasq}^2 + b k u - 2 b k - b u^2 + 3 b u$

$- 2 b + k u^2 - 3 k u + 2 k - u^3 + 4 u^2 - 5 u + 2)$

$r := u (\text{aasq}^2 + 2 \text{aasq} u - 2 \text{aasq} + u^2 - 2 u + 1)$

degreebound: =0

applying Zeilberger algorithm for order: =3

REDUCE 708:]