```
c[m, n] = Together[

  (2 (-71 582 720 c[-22 + m, 2 + n] - 71 582 720 (1 + n) c[-22 + m, 2 + n] - 71 582 720
        s c[-22 + m, 2 + n] - 71 582 720 (1 + n) s c[-22 + m, 2 + n] +
     939 520 512 e c[-20 + m, 2 + n] + 939 520 512 e (1 + n) c[-20 + m, 2 + n] +
     939 520 512 e s c[-20 + m, 2 + n] + 939 520 512 e (1 + n) s c[-20 + m, 2 + n] -
     10 041 010 560 e^2 c[-18 + m, 2 + n] - 10 041 010 560 e^2 (1 + n) c[-18 + m, 2 + n] -
     10 041 010 560 e^2 s c[-18 + m, 2 + n] - 10 041 010 560 e^2 (1 + n) s c[-18 + m, 2 + n] +
     85 344 682 752 e^3 c[-16 + m, 2 + n] + 85 344 682 752 e^3 (1 + n) c[-16 + m, 2 + n] +
     85 344 682 752 e^3 s c[-16 + m, 2 + n] + 85 344 682 752 e^3 (1 + n) s c[-16 + m, 2 + n] -
     559 971 921 600 e^4 c[-14 + m, 2 + n] - 559 971 921 600 e^4 (1 + n) c[-14 + m, 2 + n] -
     559 971 921 600 e^4 s c[-14 + m, 2 + n] - 559 971 921 600 e^4 (1 + n) s
      c[-14 + m, 2 + n] + 2 727 863 218 080 e^5 c[-12 + m, 2 + n] + 2 727 863 218 080
      e^5 (1 + n) c[-12 + m, 2 + n] + 2 727 863 218 080 e^5 s c[-12 + m, 2 + n] +
     2 727 863 218 080 e^5 (1 + n) s c[-12 + m, 2 + n] - 9 349 531 191 000 e^6
      c[-10 + m, 2 + n] - 9 349 531 191 000 e^6 (1 + n) c[-10 + m, 2 + n] -
     9 349 531 191 000 e^6 s c[-10 + m, 2 + n] - 9 349 531 191 000 e^6 (1 + n) s
      c[-10 + m, 2 + n] + 20 788 957 589 400 e^7 c[-8 + m, 2 + n] + 20 788 957 589 400
      e^7 (1 + n) c[-8 + m, 2 + n] + 20 788 957 589 400 e^7 s c[-8 + m, 2 + n] +
     20 788 957 589 400 e^7 (1 + n) s c[-8 + m, 2 + n] - 25 986 196 986 750 e^8
      c[-6 + m, 2 + n] - 25 986 196 986 750 e^8 (1 + n) c[-6 + m, 2 + n] -
     25 986 196 986 750 e^8 s c[-6 + m, 2 + n] - 25 986 196 986 750 e^8 (1 + n) s
      c[-6 + m, 2 + n] - 103 944 787 947 000 √2 b40 e^{15/2} c[-5 + m, 2 + n] -
     103 944 787 947 000 √2 b40 e^{15/2} (1 + n) c[-5 + m, 2 + n] -
     103 944 787 947 000 √2 b40 e^{15/2} s c[-5 + m, 2 + n] -
     103 944 787 947 000 √2 b40 e^{15/2} (1 + n) s c[-5 + m, 2 + n] +
     103 944 787 947 000 √2 b31 e^{15/2} c[-4 + m, 1 + n] -
     103 944 787 947 000 √2 b31 e^{15/2} (1 + n) c[-4 + m, 1 + n] -
     103 944 787 947 000 √2 b31 e^{15/2} (1 + n) s c[-4 + m, 1 + n] +
     12 993 098 493 375 e^9 c[-4 + m, 2 + n] + 12 993 098 493 375 e^9
      (1 + n) c[-4 + m, 2 + n] + 12 993 098 493 375 e^9 s c[-4 + m, 2 + n] +
     12 993 098 493 375 e^9 (1 + n) s c[-4 + m, 2 + n] + 311 834 363 841 000 √2 b22
      e^{15/2} c[-3 + m, n] - 103 944 787 947 000 √2 b22 e^{15/2} (1 + n) c[-3 + m, n] +
     103 944 787 947 000 √2 b22 e^{15/2} s c[-3 + m, n] - 103 944 787 947 000 √2
      b22 e^{15/2} (1 + n) s c[-3 + m, n] + 51 972 393 973 500 b21 e^8 c[-3 + m, 1 + n] -
     51 972 393 973 500 b21 e^8 (1 + n) c[-3 + m, 1 + n] - 51 972 393 973 500 b21 e^8
      (1 + n) s c[-3 + m, 1 + n] + 519 723 939 735 000 √2 b13 e^{15/2} c[-2 + m, -1 + n] -
     103 944 787 947 000 √2 b13 e^{15/2} (1 + n) c[-2 + m, -1 + n] +
     207 889 575 894 000 √2 b13 e^{15/2} s c[-2 + m, -1 + n] -
     103 944 787 947 000 √2 b13 e^{15/2} (1 + n) s c[-2 + m, -1 + n] + 155 917 181 920 500
      b12 e^8 c[-2 + m, n] - 51 972 393 973 500 b12 e^8 (1 + n) c[-2 + m, n] +
     51 972 393 973 500 b12 e^8 s c[-2 + m, n] - 51 972 393 973 500 b12 e^8 (1 + n)
      s c[-2 + m, n] + 727 613 515 629 000 √2 b04 e^{15/2} c[-1 + m, -2 + n] -
     103 944 787 947 000 √2 b04 e^{15/2} (1 + n) c[-1 + m, -2 + n] +
     311 834 363 841 000 √2 b04 e^{15/2} s c[-1 + m, -2 + n] -
     103 944 787 947 000 √2 b04 e^{15/2} (1 + n) s c[-1 + m, -2 + n] +
```

$259\,861\,969\,867\,500\,b03\,e^8\,c[-1+m,\,-1+n] - 51\,972\,393\,973\,500\,b03\,e^8$

$(1+n)\,c[-1+m,\,-1+n] + 103\,944\,787\,947\,000\,b03\,e^8\,s\,c[-1+m,\,-1+n] -$

$51\,972\,393\,973\,500\,b03\,e^8\,(1+n)\,s\,c[-1+m,\,-1+n] + 38\,979\,295\,480\,125\,\sqrt{2}$

$b02\,e^{17/2}\,c[-1+m,\,n] - 12\,993\,098\,493\,375\,\sqrt{2}\,b02\,e^{17/2}\,(1+n)\,c[-1+m,\,n] +$

$12\,993\,098\,493\,375\,\sqrt{2}\,b02\,e^{17/2}\,s\,c[-1+m,\,n] - 12\,993\,098\,493\,375\,\sqrt{2}$

$b02\,e^{17/2}\,(1+n)\,s\,c[-1+m,\,n]\big)\big) \Big/ \big(12\,993\,098\,493\,375\,e^9\,m\,(1+s)\big)\Big]$

u1[k] =

$\text{Together}\Big[\dfrac{1}{12\,993\,098\,493\,375\,e^9}\,\big(-143\,165\,440\,c[-21+k,\,1] - 143\,165\,440\,s\,c[-21+k,\,1] +$

$1\,879\,041\,024\,e\,c[-19+k,\,1] + 1\,879\,041\,024\,e\,s\,c[-19+k,\,1] -$

$20\,082\,021\,120\,e^2\,c[-17+k,\,1] - 20\,082\,021\,120\,e^2\,s\,c[-17+k,\,1] +$

$170\,689\,365\,504\,e^3\,c[-15+k,\,1] + 170\,689\,365\,504\,e^3\,s\,c[-15+k,\,1] -$

$1\,119\,943\,843\,200\,e^4\,c[-13+k,\,1] - 1\,119\,943\,843\,200\,e^4\,s\,c[-13+k,\,1] +$

$5\,455\,726\,436\,160\,e^5\,c[-11+k,\,1] + 5\,455\,726\,436\,160\,e^5\,s\,c[-11+k,\,1] -$

$18\,699\,062\,382\,000\,e^6\,c[-9+k,\,1] - 18\,699\,062\,382\,000\,e^6\,s\,c[-9+k,\,1] +$

$41\,577\,915\,178\,800\,e^7\,c[-7+k,\,1] + 41\,577\,915\,178\,800\,e^7\,s\,c[-7+k,\,1] -$

$51\,972\,393\,973\,500\,e^8\,c[-5+k,\,1] - 51\,972\,393\,973\,500\,e^8\,s\,c[-5+k,\,1] -$

$207\,889\,575\,894\,000\,\sqrt{2}\,b40\,e^{15/2}\,c[-4+k,\,1] -$

$207\,889\,575\,894\,000\,\sqrt{2}\,b40\,e^{15/2}\,s\,c[-4+k,\,1] +$

$207\,889\,575\,894\,000\,\sqrt{2}\,b31\,e^{15/2}\,c[-3+k,\,0] + 25\,986\,196\,986\,750\,e^9\,c[-3+k,\,1] +$

$25\,986\,196\,986\,750\,e^9\,s\,c[-3+k,\,1] + 623\,668\,727\,682\,000\,\sqrt{2}\,b22\,e^{15/2}\,c[-2+k,\,-1] +$

$207\,889\,575\,894\,000\,\sqrt{2}\,b22\,e^{15/2}\,s\,c[-2+k,\,-1] +$

$103\,944\,787\,947\,000\,b21\,e^8\,c[-2+k,\,0] + 1\,039\,447\,879\,470\,000\,\sqrt{2}\,b13$

$e^{15/2}\,c[-1+k,\,-2] + 415\,779\,151\,788\,000\,\sqrt{2}\,b13\,e^{15/2}\,s\,c[-1+k,\,-2] +$

$311\,834\,363\,841\,000\,b12\,e^8\,c[-1+k,\,-1] + 103\,944\,787\,947\,000\,b12\,e^8\,s\,c[-1+k,\,-1] +$

$1\,455\,227\,031\,258\,000\,\sqrt{2}\,b04\,e^{15/2}\,c[k,\,-3] +$

$623\,668\,727\,682\,000\,\sqrt{2}\,b04\,e^{15/2}\,s\,c[k,\,-3] + 519\,723\,939\,735\,000\,b03\,e^8\,c[k,\,-2] +$

$207\,889\,575\,894\,000\,b03\,e^8\,s\,c[k,\,-2] + 77\,958\,590\,960\,250\,\sqrt{2}\,b02\,e^{17/2}\,c[k,\,-1] +$

$25\,986\,196\,986\,750\,\sqrt{2}\,b02\,e^{17/2}\,s\,c[k,\,-1] -$

$12\,993\,098\,493\,375\,e^9\,c[1+k,\,-1] - 12\,993\,098\,493\,375\,e^9\,k\,c[1+k,\,-1] -$

$12\,993\,098\,493\,375\,e^9\,s\,c[1+k,\,-1] - 12\,993\,098\,493\,375\,e^9\,k\,s\,c[1+k,\,-1]\big)\Big]$