Coefficients for the Laguerre Polynomials $L_n(x)$ and for x^n in terms of $L_m(x)$

Table 22.10

$$L_n(x)=a_n^{-1}\sum_{m=0}^{n}c_m x^m \qquad x^n=\sum_{m=0}^{n}d_m L_m(x)$$

	a_n	x^0	x^1	x^2	x^3	x^4	x^5	x^6	x^7	x^8	x^9	x^{10}	x^{11}	x^{12}	
L_0	1	1	1	2	6	24	120	720	5040	40320	362880	3628800	39916800	479001600	L_0
L_1	1	1	−1	−4	−18	−96	−600	−4320	−35280	−322560	−3265920	−36288000	−439084800	−5748019200	L_1
L_2	2	2	−4	1	2	18	144	1200	10800	105840	1128960	13063680	163296000	2195424000	31614105600	L_2
L_3	6	6	−18	9	−1	−6	−96	−1200	−14400	−176400	−2257920	−30481920	−435456000	−6586272000	−105380352000	L_3
L_4	24	24	−96	72	−16	1	24	600	10800	176400	2822400	45722880	762048000	13172544000	237105792000	L_4
L_5	120	120	−600	600	−200	25	−1	−120	−4320	−105840	−2257920	−45722880	−914457600	−18441561600	−379369267200	L_5
L_6	720	720	−4320	5400	−2400	450	−36	1	720	35280	1128960	30481920	762048000	18441561600	442597478400	L_6
L_7	5040	5040	−35280	52920	−29400	7350	−882	49	−1	−5040	−322560	−13063680	−435456000	−13172544000	−379369267200	L_7
L_8	40320	40320	−322560	564480	−376320	117600	−18816	1568	−64	1	40320	* 3265920	163296000	6586272000	237105792000	L_8
L_9	362880	362880	−3265920	6531840	−5080320	1905120	−381024	42336	−2592	81	−1	−362880	−36288000	−2195424000	−105380352000	L_9
L_{10}	3628800	3628800	−36288000	81648000	−72576000	31752000	−7620480	1058400	−86400	4050	−100	1	3628800	439084800	31614105600	L_{10}
L_{11}	39916800	39916800	−439084800	1097712000	−1097712000	548856000	−153679680	25613280	−2613600	163350	−6050	121	−1	−39916800	−5748019200	L_{11}
L_{12}	479001600	479001600	−5748019200	15807052800	−17563392000	9879408000	−3161410560	614718720	−75271680	5880600	−290400	8712	−144	1	479001600	L_{12}
	a_n	x^0	x^1	x^2	x^3	x^4	x^5	x^6	x^7	x^8	x^9	x^{10}	x^{11}	x^{12}	

*See page 11.

$$L_6(x)=\frac{1}{720}\left[x^6-36x^5+450x^4-2400x^3+5400x^2-4320x+720\right] \qquad x^6=720L_0-4320L_1+10800L_2-14400L_3+10800L_4-4320L_5+720L_6$$