

# Calcul des formules $\Lambda_{n,k}^*$

19 juin 2013

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## 1 Génération des formules

Les formules de remaillage de la forme  $\Lambda_{n,k}^*$  sont des fonctions polynomiales par morceaux, symétriques, de support  $]-n+1, n-1[$ , de régularité  $C^k$  qui conservent les  $n$  premiers moments. La formule est donnée par  $n-1$  polynômes de degré  $2k+1$ . Les différentes formules générées sont résumées dans le tableau suivant :

		Moments	Régularité	Nb points	Degré	Support
$\Lambda_{2,1}^*$	(3)	2	$C^1$	4	3	$[-2; 2]$
$\Lambda_{2,2}^*$	(4)	2	$C^2$	4	5	$[-2; 2]$
$\Lambda_{4,2}^*$	(5)	4	$C^2$	6	5	$[-3; 3]$
$\Lambda_{4,3}^*$	(6)	4	$C^3$	6	7	$[-3; 3]$
$\Lambda_{4,4}^*$	(7)	4	$C^4$	6	9	$[-3; 3]$
$\Lambda_{6,3}^*$	(8)	6	$C^3$	8	7	$[-4; 4]$
$\Lambda_{6,4}^*$	(9)	6	$C^4$	8	9	$[-4; 4]$
$\Lambda_{6,5}^*$	(10)	6	$C^5$	8	11	$[-4; 4]$
$\Lambda_{6,6}^*$	(11)	6	$C^6$	8	13	$[-4; 4]$
$\Lambda_{8,4}^*$	(12)	8	$C^4$	10	9	$[-5; 5]$

TABLE 1: Caractéristiques des formules de remaillage

Les contraintes utilisées sont les suivantes :

- Exactitude aux points de coordonnées entières
- Raccords  $C^k$  entre les polynômes
- Conservation des moments discrets :

$$\sum_{l=-N}^N l^q \Lambda_{n,k}^*(s-l) = s^q, \quad 0 < s < 1, q = 0 \dots n \quad (1)$$

Remarque : pour chaque formule les moments continus sont conservés :

$$\int_{-\infty}^{\infty} x^q \Lambda_{n,k}^*(x) dx = \begin{cases} 1 & \text{si } q = 0 \\ 0 & \text{sinon} \end{cases}$$

(2)

## 2 Formules

$$\Lambda_{2,1}^*(x) = \begin{cases} 1 - \frac{5}{2}|x|^2 + \frac{3}{2}|x|^3 & 0 \leq |x| < 1 \\ 2 - 4|x| + \frac{5}{2}|x|^2 - \frac{1}{2}|x|^3 & 1 \leq |x| < 2 \\ 0 & |x| \geq 2 \end{cases} \quad (3)$$

$$\Lambda_{2,2}^*(x) = \begin{cases} 1 - |x|^2 - \frac{9}{2}|x|^3 + \frac{15}{2}|x|^4 - 3|x|^5 & 0 \leq |x| < 1 \\ -4 + 18|x| - 29|x|^2 + \frac{43}{2}|x|^3 - \frac{15}{2}|x|^4 + |x|^5 & 1 \leq |x| < 2 \\ 0 & |x| \geq 2 \end{cases} \quad (4)$$

$$\Lambda_{4,2}^*(x) = \begin{cases} 1 - \frac{5}{4}|x|^2 - \frac{35}{12}|x|^3 + \frac{21}{4}|x|^4 - \frac{25}{12}|x|^5 & 0 \leq |x| < 1 \\ -4 + \frac{75}{4}|x| - \frac{245}{8}|x|^2 + \frac{545}{24}|x|^3 - \frac{63}{8}|x|^4 + \frac{25}{24}|x|^5 & 1 \leq |x| < 2 \\ 18 - \frac{153}{4}|x| + \frac{255}{8}|x|^2 - \frac{313}{24}|x|^3 + \frac{21}{8}|x|^4 - \frac{5}{24}|x|^5 & 2 \leq |x| < 3 \\ 0 & |x| \geq 3 \end{cases} \quad (5)$$

$$\Lambda_{4,4}^*(x) = \begin{cases} 1 - \frac{5}{4}|x|^2 - \frac{28}{3}|x|^4 + \frac{145}{6}|x|^5 - \frac{245}{12}|x|^6 + \frac{35}{6}|x|^7 & 0 \leq |x| < 1 \\ 31 - \frac{1945}{12}|x| + \frac{2905}{8}|x|^2 - \frac{5345}{12}|x|^3 + \frac{1281}{4}|x|^4 - \frac{1615}{12}|x|^5 + \frac{245}{8}|x|^6 - \frac{35}{12}|x|^7 & 1 \leq |x| < 2 \\ -297 + \frac{3501}{4}|x| - \frac{8775}{8}|x|^2 + \frac{3029}{4}|x|^3 - \frac{3731}{12}|x|^4 + \frac{911}{12}|x|^5 - \frac{245}{24}|x|^6 + \frac{7}{12}|x|^7 & 2 \leq |x| < 3 \\ 0 & |x| \geq 3 \end{cases} \quad (6)$$

$$\Lambda_{4,4}^*(x) = \begin{cases} 1 - \frac{5}{4}|x|^2 + \frac{1}{4}|x|^4 - \frac{100}{3}|x|^5 + \frac{455}{4}|x|^6 - \frac{295}{2}|x|^7 + \frac{345}{4}|x|^8 - \frac{115}{6}|x|^9 & 0 \leq |x| < 1 \\ -199 + \frac{5485}{4}|x| - \frac{32975}{8}|x|^2 + \frac{28425}{4}|x|^3 - \frac{61953}{8}|x|^4 + \frac{33175}{6}|x|^5 & 1 \leq |x| < 2 \\ 5913 - \frac{89235}{4}|x| + \frac{297585}{8}|x|^2 - \frac{143895}{4}|x|^3 + \frac{177871}{8}|x|^4 - \frac{54641}{6}|x|^5 & 2 \leq |x| < 3 \\ 0 & |x| \geq 3 \end{cases} \quad (7)$$

$$\Lambda_{6,3}^*(x) = \begin{cases} 1 - \frac{49}{36}|x|^2 - \frac{959}{144}|x|^4 + \frac{2569}{144}|x|^5 - \frac{727}{48}|x|^6 + \frac{623}{144}|x|^7 & 0 \leq |x| < 1 \\ \frac{138}{5} - \frac{8617}{60}|x| + \frac{12873}{40}|x|^2 - \frac{791}{2}|x|^3 + \frac{4557}{16}|x|^4 - \frac{9583}{80}|x|^5 + \frac{2181}{80}|x|^6 - \frac{623}{240}|x|^7 & 1 \leq |x| < 2 \\ -440 + \frac{25949}{20}|x| - \frac{117131}{72}|x|^2 + \frac{2247}{2}|x|^3 - \frac{66437}{144}|x|^4 + \frac{81109}{720}|x|^5 - \frac{727}{48}|x|^6 + \frac{623}{720}|x|^7 & 2 \leq |x| < 3 \\ \frac{3632}{5} - \frac{7456}{5}|x| + \frac{58786}{45}|x|^2 - 633|x|^3 + \frac{26383}{144}|x|^4 - \frac{22807}{720}|x|^5 + \frac{727}{240}|x|^6 - \frac{89}{720}|x|^7 & 3 \leq |x| < 4 \\ 0 & |x| \geq 4 \end{cases} \quad (8)$$

$$\Lambda_{6,4}^*(x) = \begin{cases} 1 - \frac{49}{36}|x|^2 + \frac{7}{18}|x|^4 - \frac{3521}{144}|x|^5 + \frac{12029}{144}|x|^6 - \frac{15617}{144}|x|^7 + \frac{1015}{16}|x|^8 - \frac{1015}{72}|x|^9 & 0 \leq |x| < 1 \\ -\frac{877}{5} + \frac{72583}{60}|x| - \frac{145467}{40}|x|^2 + \frac{18809}{3}|x|^3 - \frac{54663}{8}|x|^4 + \frac{390327}{80}|x|^5 & 1 \leq |x| < 2 \\ 8695 - \frac{656131}{20}|x| + \frac{3938809}{72}|x|^2 - \frac{158725}{3}|x|^3 + \frac{2354569}{72}|x|^4 - \frac{9644621}{720}|x|^5 & 2 \leq |x| < 3 \\ -\frac{142528}{5} + \frac{375344}{5}|x| - \frac{3942344}{45}|x|^2 + \frac{178394}{3}|x|^3 - \frac{931315}{36}|x|^4 + \frac{5385983}{720}|x|^5 & 3 \leq |x| < 4 \\ 0 & |x| \geq 4 \end{cases} \quad (9)$$

$$\Lambda_{6,5}^*(x) = \begin{cases} 1 - \frac{49}{36}|x|^2 + \frac{7}{18}|x|^4 - \frac{701}{8}|x|^6 + \frac{54803}{144}|x|^7 - \frac{32165}{48}|x|^8 + \frac{9555}{16}|x|^9 - \frac{38731}{144}|x|^{10} + \frac{3521}{72}|x|^{11} & 0 \leq |x| < 1 \\ 1233 - \frac{617533}{60}|x| + \frac{1544613}{40}|x|^2 - \frac{515179}{6}|x|^3 + \frac{502579}{4}|x|^4 - \frac{3809911}{30}|x|^5 \\ \quad + \frac{3618099}{40}|x|^6 - \frac{10894163}{240}|x|^7 + \frac{251685}{16}|x|^8 - \frac{172123}{48}|x|^9 + \frac{38731}{80}|x|^{10} - \frac{3521}{120}|x|^{11} & 1 \leq |x| < 2 \\ -181439 + \frac{16709441}{20}|x| - \frac{125352311}{72}|x|^2 + \frac{13002493}{6}|x|^3 - \frac{64445353}{36}|x|^4 + \frac{30912301}{30}|x|^5 \\ \quad - \frac{3373567}{8}|x|^6 + \frac{88345523}{720}|x|^7 - \frac{1194095}{48}|x|^8 + \frac{160657}{48}|x|^9 - \frac{38731}{144}|x|^{10} + \frac{3521}{360}|x|^{11} & 2 \leq |x| < 3 \\ 1188352 - \frac{19108864}{5}|x| + \frac{250837216}{45}|x|^2 - \frac{14600752}{3}|x|^3 + \frac{25437902}{9}|x|^4 - \frac{17195278}{15}|x|^5 \\ \quad + \frac{13253241}{40}|x|^6 - \frac{49136309}{720}|x|^7 + \frac{471205}{48}|x|^8 - \frac{45083}{48}|x|^9 + \frac{38731}{720}|x|^{10} - \frac{503}{360}|x|^{11} & 3 \leq |x| < 4 \\ 0 & |x| \geq 4 \end{cases} \quad (10)$$

$$\Lambda_{6,6}^*(x) = \begin{cases} 1 - \frac{49}{36}|x|^2 + \frac{7}{18}|x|^4 - \frac{1}{36}|x|^6 - \frac{46109}{144}|x|^7 + \frac{81361}{48}|x|^8 - \frac{544705}{144}|x|^9 + \frac{655039}{144}|x|^{10} \\ \quad - \frac{223531}{72}|x|^{11} + \frac{81991}{72}|x|^{12} - \frac{6307}{36}|x|^{13} & 0 \leq |x| < 1 \\ -\frac{44291}{5} + \frac{1745121}{20}|x| - \frac{15711339}{40}|x|^2 + \frac{32087377}{30}|x|^3 - \frac{7860503}{4}|x|^4 + \frac{38576524}{15}|x|^5 \\ \quad - \frac{24659323}{10}|x|^6 + \frac{84181657}{48}|x|^7 - \frac{74009313}{80}|x|^8 + \frac{17159513}{48}|x|^9 - \frac{7870247}{80}|x|^{10} \\ \quad + \frac{438263}{24}|x|^{11} - \frac{81991}{40}|x|^{12} + \frac{6307}{60}|x|^{13} & 1 \leq |x| < 2 \\ 3905497 - \frac{424679647}{20}|x| + \frac{3822627865}{72}|x|^2 - \frac{2424839767}{30}|x|^3 + \frac{3009271097}{36}|x|^4 - \frac{930168127}{15}|x|^5 \\ \quad + \frac{305535494}{9}|x|^6 - \frac{9998313437}{720}|x|^7 + \frac{203720335}{48}|x|^8 - \frac{137843153}{144}|x|^9 + \frac{22300663}{144}|x|^{10} \\ \quad - \frac{6126883}{360}|x|^{11} + \frac{81991}{72}|x|^{12} - \frac{6307}{180}|x|^{13} & 2 \leq |x| < 3 \\ -\frac{255622144}{5} + \frac{971097344}{5}|x| - \frac{15295867328}{45}|x|^2 + \frac{5442932656}{15}|x|^3 - \frac{2372571796}{9}|x|^4 + \frac{2064517469}{15}|x|^5 \\ \quad - \frac{9563054381}{180}|x|^6 + \frac{2210666335}{144}|x|^7 - \frac{796980541}{240}|x|^8 + \frac{76474979}{144}|x|^9 - \frac{43946287}{720}|x|^{10} \\ \quad + \frac{343721}{72}|x|^{11} - \frac{81991}{360}|x|^{12} + \frac{901}{180}|x|^{13} & 3 \leq |x| < 4 \\ 0 & |x| \geq 4 \end{cases} \quad (11)$$

$$\Lambda_{8,4}^*(x) = \begin{cases} 1 - \frac{205}{144}x^2 + \frac{91}{192}x^4 - \frac{6181}{320}x^5 + \frac{6337}{96}x^6 - \frac{2745}{32}x^7 + \frac{28909}{576}x^8 - \frac{3569}{320}x^9 & 0 \leq |x| < 1 \\ -154 + \frac{12757}{12}x - \frac{230123}{72}x^2 + \frac{264481}{48}x^3 - \frac{576499}{96}x^4 + \frac{686147}{160}x^5 \\ \quad - \frac{96277}{48}x^6 + \frac{14221}{24}x^7 - \frac{28909}{288}x^8 + \frac{3569}{480}x^9 & 1 \leq |x| < 2 \\ \frac{68776}{7} - \frac{1038011}{28}x + \frac{31157515}{504}x^2 - \frac{956669}{16}x^3 + \frac{3548009}{96}x^4 - \frac{2422263}{160}x^5 \\ \quad + \frac{197255}{48}x^6 - \frac{19959}{28}x^7 + \frac{144545}{2016}x^8 - \frac{3569}{1120}x^9 & 2 \leq |x| < 3 \\ -56375 + \frac{8314091}{56}x - \frac{49901303}{288}x^2 + \frac{3763529}{32}x^3 - \frac{19648027}{384}x^4 + \frac{9469163}{640}x^5 \\ \quad - \frac{545977}{192}x^6 + \frac{156927}{448}x^7 - \frac{28909}{1152}x^8 + \frac{3569}{4480}x^9 & 3 \leq |x| < 4 \\ \frac{439375}{7} - \frac{64188125}{504}x + \frac{231125375}{2016}x^2 - \frac{17306975}{288}x^3 + \frac{7761805}{384}x^4 - \frac{2895587}{640}x^5 \\ \quad + \frac{129391}{192}x^6 - \frac{259715}{4032}x^7 + \frac{28909}{8064}x^8 - \frac{3569}{40320}x^9 & 4 \leq |x| < 5 \\ 0 & |x| \geq 5 \end{cases} \quad (12)$$

### 3 Code

y est la distance entre la particule et son plus proche point de grille, de coordonnée inférieure à la position de la particule. Les poids sont données dans l'ordre croissant des point de grille du support.

$\Lambda_{2,1}^*$

```
w[0] = (-1 + (2 - y) * y) * y / 2;
w[1] = 1 + (-5 + 3 * y) * y * y / 2;
w[2] = (1 + (4 - 3 * y) * y) * y / 2;
w[3] = (y - 1) * y * y / 2;
```

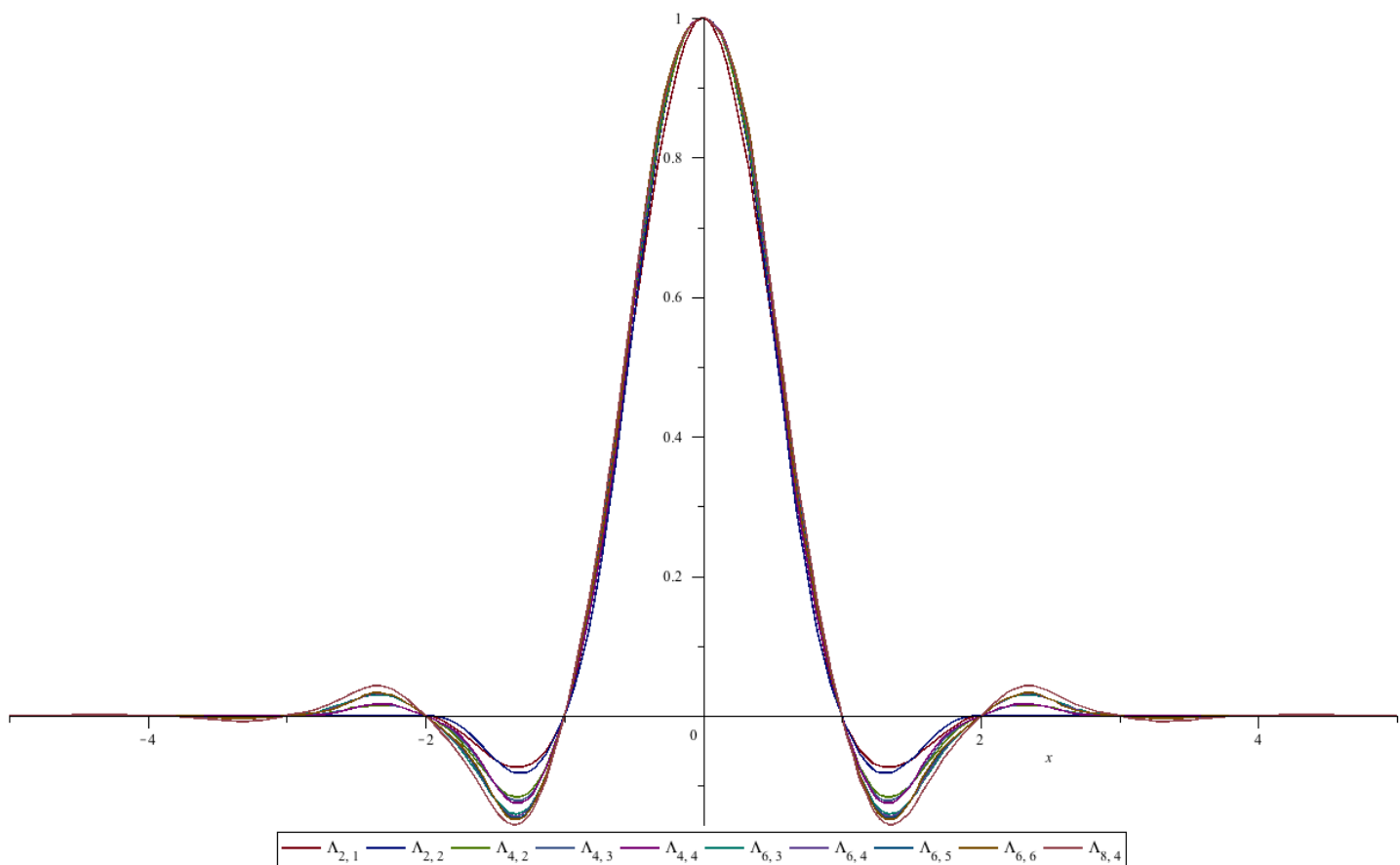


FIGURE 1:  $\Lambda_{n,k}^*$

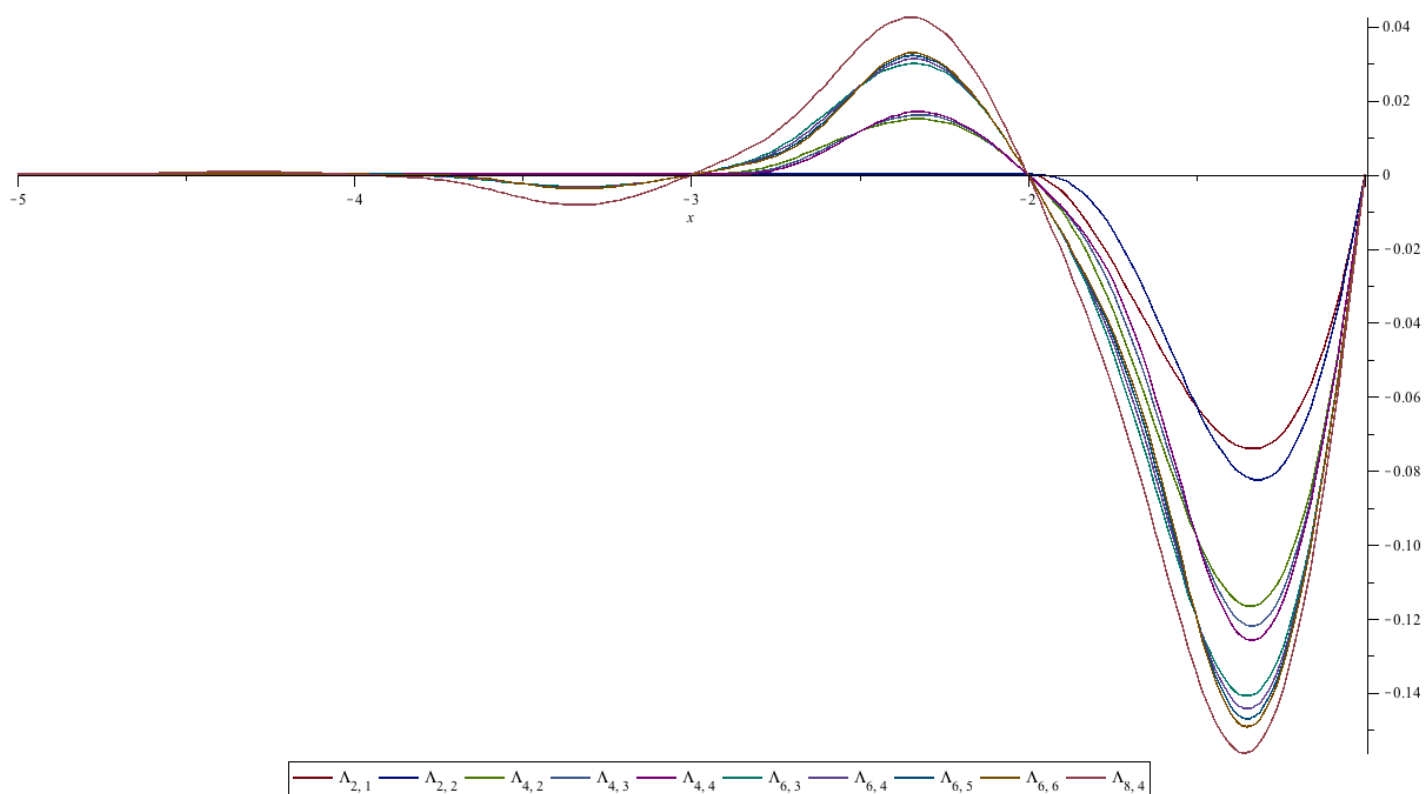


FIGURE 2:  $\Lambda_{n,k}^*$ , détail

$$\Lambda_{2,2}^*$$

$$\begin{aligned} w[0] &= (-1 + (1 + (3 + (-5 + 2 * y) * y) * y) * y) * y / 2; \\ w[1] &= 1 + (-2 + (-9 + (15 - 6 * y) * y) * y) * y * y / 2; \\ w[2] &= (1 + (1 + (9 + (-15 + 6 * y) * y) * y) * y) * y / 2; \\ w[3] &= (-3 + (5 - 2 * y) * y) * y * y * y / 2; \end{aligned}$$

$$\Lambda_{4,2}^*$$

$$\begin{aligned} w[0] &= (2 + (-1 + (-9 + (13 - 5 * y) * y) * y) * y) * y / 24; \\ w[1] &= (-16 + (16 + (39 + (-64 + 25 * y) * y) * y) * y) * y / 24; \\ w[2] &= 1 + (-30 + (-70 + (126 - 50 * y) * y) * y) * y * y / 24; \\ w[3] &= (16 + (16 + (66 + (-124 + 50 * y) * y) * y) * y) * y / 24; \\ w[4] &= (-2 + (-1 + (-33 + (61 - 25 * y) * y) * y) * y) * y / 24; \\ w[5] &= (7 + (-12 + 5 * y) * y) * y * y * y / 24; \end{aligned}$$

$$\Lambda_{4,3}^*$$

$$\begin{aligned} w[0] &= (2 + (-1 + (-2 + (-22 + (58 + (-49 + 14 * y) * y) * y) * y) * y) * y) * y / 24; \\ w[1] &= (-16 + (16 + (4 + (111 + (-290 + (245 - 70 * y) * y) * y) * y) * y) * y) * y / 24; \\ w[2] &= 1 + (-30 + (-224 + (580 + (-490 + 140 * y) * y) * y) * y) * y * y / 24; \\ w[3] &= (16 + (16 + (-4 + (226 + (-580 + (490 - 140 * y) * y) * y) * y) * y) * y) * y / 24; \\ w[4] &= (-2 + (-1 + (2 + (-114 + (290 + (-245 + 70 * y) * y) * y) * y) * y) * y) * y / 24; \\ w[5] &= (23 + (-58 + (49 - 14 * y) * y) * y) * y * y * y * y / 24; \end{aligned}$$

$$\Lambda_{4,4}^*$$

$$\begin{aligned} w[0] &= (2 + (-1 + (-2 + (1 + (-80 + (273 + (-354 + (207 - 46 * y) * y) * y) * y) * y) * y) * y) * y / 24; \\ w[1] &= (-16 + (16 + (4 + (-4 + (400 + (-1365 + (1770 + (-1035 + 230 * y) * y) * y) * y) * y) * y) * y) * y / 24; \\ w[2] &= 1 + (-30 + (6 + (-800 + (2730 + (-3540 + (2070 - 460 * y) * y) * y) * y) * y) * y) * y * y / 24; \\ w[3] &= (16 + (16 + (-4 + (-4 + (800 + (-2730 + (3540 + (-2070 + 460 * y) * y) * y) * y) * y) * y) * y) * y / 24; \\ w[4] &= (-2 + (-1 + (2 + (1 + (-400 + (1365 + (-1770 + (1035 - 230 * y) * y) * y) * y) * y) * y) * y) * y / 24; \\ w[5] &= (80 + (-273 + (354 + (-207 + 46 * y) * y) * y) * y) * y * y * y * y * y / 24; \end{aligned}$$

$$\Lambda_{6,3}^*$$

$$\begin{aligned} w[0] &= (-12 + (4 + (15 + (140 + (-370 + (312 - 89 * y) * y) * y) * y) * y) * y) * y / 720; \\ w[1] &= (108 + (-54 + (-120 + (-955 + (2581 + (-2183 + 623 * y) * y) * y) * y) * y) * y) * y / 720; \\ w[2] &= (-540 + (540 + (195 + (2850 + (-7722 + (6546 - 1869 * y) * y) * y) * y) * y) * y) * y / 720; \\ w[3] &= 1 + (-980 + (-4795 + (12845 + (-10905 + 3115 * y) * y) * y) * y) * y * y / 720; \\ w[4] &= (540 + (540 + (-195 + (4880 + (-12830 + (10900 - 3115 * y) * y) * y) * y) * y) * y) * y / 720; \\ w[5] &= (-108 + (-54 + (120 + (-2985 + (7695 + (-6537 + 1869 * y) * y) * y) * y) * y) * y) * y / 720; \\ w[6] &= (12 + (4 + (-15 + (1010 + (-2566 + (2178 - 623 * y) * y) * y) * y) * y) * y) * y / 720; \\ w[7] &= (-145 + (367 + (-311 + 89 * y) * y) * y) * y * y * y * y / 720; \end{aligned}$$

$\Lambda_{6,4}^*$

$$\begin{aligned}w[0] &= (-12 + (4 + (15 + (-5 + (500 + (-1718 + (2231 + (-1305 + 290 * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[1] &= (108 + (-54 + (-120 + (60 + (-3509 + (12027 + (-15617 + (9135 - 2030 * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[2] &= (-540 + (540 + (195 + (-195 + (10548 + (-36084 + (46851 + (-27405 + 6090 * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[3] &= 1 + (-980 + (280 + (-17605 + (60145 + (-78085 + (45675 - 10150 * y) * y) * y) * y) * y) * y) * y / 720; \\w[4] &= (540 + (540 + (-195 + (-195 + (17620 + (-60150 + (78085 + (-45675 + 10150 * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[5] &= (-108 + (-54 + (120 + (60 + (-10575 + (36093 + (-46851 + (27405 - 6090 * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[6] &= (12 + (4 + (-15 + (-5 + (3524 + (-12032 + (15617 + (-9135 + 2030 * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[7] &= (-503 + (1719 + (-2231 + (1305 - 290 * y) * y) * y) * y) * y) * y * y * y * y * y / 720;\end{aligned}$$

$\Lambda_{6,5}^*$

$$\begin{aligned}w[0] &= (-12 + (4 + (15 + (-5 + (-3 + (1803 + (-7829 + (13785 + (-12285 + (5533 - 1006 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[1] &= (108 + (-54 + (-120 + (60 + (12 + (-12620 + (54803 + (-96495 + (85995 + (-38731 + 7042 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[2] &= (-540 + (540 + (195 + (-195 + (-15 + (37857 + (-164409 + (289485 + (-257985 + (116193 - 21126 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[3] &= 1 + (-980 + (280 + (-63090 + (274015 + (-482475 + (429975 + (-193655 + 35210 * y) * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[4] &= (540 + (540 + (-195 + (-195 + (15 + (63085 + (-274015 + (482475 + (-429975 + (193655 - 35210 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[5] &= (-108 + (-54 + (120 + (60 + (-12 + (-37848 + (164409 + (-289485 + (257985 + (-116193 + 21126 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[6] &= (12 + (4 + (-15 + (-5 + (3 + (12615 + (-54803 + (96495 + (-85995 + (38731 - 7042 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[7] &= (-1802 + (7829 + (-13785 + (12285 + (-5533 + 1006 * y) * y) * y) * y) * y) * y) * y * y * y * y / 720;\end{aligned}$$

$\Lambda_{6,6}^*$

$$\begin{aligned}w[0] &= (-12 + (4 + (15 + (-5 + (-3 + (1 + (6587 + (-34869 + (77815 + (-93577 + (63866 + (-23426 + 3604 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[1] &= (108 + (-54 + (-120 + (60 + (12 + (-6 + (-46109 + (244083 + (-544705 + (655039 + (-447062 + (163982 - 25228 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[2] &= (-540 + (540 + (195 + (-195 + (-15 + (15 + (138327 + (-732249 + (1634115 + (-1965117 + (1341186 + (-491946 + 75684 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[3] &= 1 + (-980 + (280 + (-20 + (-230545 + (1220415 + (-2723525 + (3275195 + (-2235310 + (819910 - 126140 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[4] &= (540 + (540 + (-195 + (-195 + (15 + (15 + (230545 + (-1220415 + (2723525 + (-3275195 + (2235310 + (-819910 + 126140 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y / 720; \\w[5] &= (-108 + (-54 + (120 + (60 + (-12 + (-6 + (-138327 + (732249 + (-1634115 + (1965117\end{aligned}$$

$$\begin{aligned}
& + (-1341186 + (491946 - 75684 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) \\
& * y) * y) * y / 720; \\
w[6] = & (12 + (4 + (-15 + (-5 + (3 + (1 + (46109 + (-244083 + (544705 + (-655039 + (447062 \\
& + (-163982 + 25228 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) * y) \\
& * y / 720; \\
w[7] = & (-6587 + (34869 + (-77815 + (93577 + (-63866 + (23426 - 3604 * y) * y) * y) * y) \\
& * y) * y) * y * y * y * y * y * y * y / 720;
\end{aligned}$$

$$\Lambda_{8,4}^*$$

$$\begin{aligned}
w[0] = & (144 + (-36 + (-196 + (49 + (-6125 + (21126 + (-27454 + (16061 - 3569 * y) * y) * y) \\
& * y) * y) * y) * y) * y) * y / 40320; \\
w[1] = & (-1536 + (512 + (2016 + (-672 + (55125 + (-190092 + (247074 + (-144548 + 32121 * y) \\
& * y) * y) * y) * y) * y) * y) * y) * y / 40320; \\
w[2] = & (8064 + (-4032 + (-9464 + (4732 + (-221060 + (760312 + (-988256 + (578188 - 128484 \\
& * y) * y) * y) * y) * y) * y) * y) * y) * y / 40320; \\
w[3] = & (-32256 + (32256 + (13664 + (-13664 + (517580 + (-1774136 + (2305856 + (-1349096 \\
& + 299796 * y) * y) * y) * y) * y) * y) * y) * y) * y / 40320; \\
w[4] = & 1 + (-57400 + (19110 + (-778806 + (2661540 + (-3458700 + (2023630 - 449694 * y) * y) \\
& * y) * y) * y) * y * y) * y * y) * y / 40320; \\
w[5] = & (32256 + (32256 + (-13664 + (-13664 + (780430 + (-2662016 + (3458644 + (-2023616 \\
& + 449694 * y) * y) * y) * y) * y) * y) * y) * y) * y) * y / 40320; \\
w[6] = & (-8064 + (-4032 + (9464 + (4732 + (-520660 + (1775032 + (-2305744 + (1349068 - 299796 \\
& * y) * y) * y) * y) * y) * y) * y) * y) * y / 40320; \\
w[7] = & (1536 + (512 + (-2016 + (-672 + (223020 + (-760872 + (988176 + (-578168 + 128484 * y) \\
& * y) * y) * y) * y) * y) * y) * y) * y) * y / 40320; \\
w[8] = & (-144 + (-36 + (196 + (49 + (-55685 + (190246 + (-247046 + (144541 - 32121 * y) * y) \\
& * y) * y) * y) * y) * y) * y) * y) * y / 40320; \\
w[9] = & (6181 + (-21140 + (27450 + (-16060 + 3569 * y) * y) * y) * y) * y * y * y * y * y / 40320;
\end{aligned}$$