

Supplementary material

HEPTAGONAL QUASICRYSTALS: CONSTRUCTION OF 2D LATTICES AND DEMONSTRATIONS USING LASER POINTERS – CONCLUDING PART*

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The Mathematica program for generation the set of points

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ListPlot[Union[  
  {{0, 0}},
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(2/2) Table[{Cos[n*al[7]], Sin[n*al[7]]}, {n, 1, 7}],
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(3/3) Table[  
  2 Cos[al[7]/  
  2]*({Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],  
  Cos[al[7]/2]}.{Cos[n*al[7]], Sin[n*al[7]]}), {n, 1, 7}],
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(4/4) Table[(1 + 2*Cos[4*Pi/14]) {Cos[n*al[7]], Sin[n*al[7]]}, {n,  
  1, 7}],
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(5/5) Table[(2*Cos[3*Pi/7] +  
  2 Cos[Pi/  
  7])*({Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],  
  Cos[al[7]/2]}.{Cos[n*al[7]], Sin[n*al[7]]})/  
  norm[({Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],  
  Cos[al[7]/2]}.{Cos[n*al[7]], Sin[n*al[7]]}), {n, 1, 7}],
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(6/6) Table[(1 + 2*Cos[4*Pi/14]) {Cos[n*al[7]], Sin[n*al[7]]}, {n,  
  1, 7}] + Table[{Cos[n*al[7]], Sin[n*al[7]]}, {n, 1, 7}],
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(6/6) Table[(2*Cos[3*Pi/7] +  
  2 Cos[Pi/  
  7])*({Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],  
  Cos[al[7]/2]}.{Cos[n*al[7]], Sin[n*al[7]]})/  
  norm[({Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],  
  Cos[al[7]/2]}.{Cos[n*al[7]], Sin[n*al[7]]}), {n, 1, 7}],
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$$\text{norm}[\{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \text{Cos}[\alpha/2]\}\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}], \{n, 1, 7\} + \text{Table}[\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 1, 7\},$$

$$(6/6) \text{Table}[(2 \cdot \text{Cos}[3\pi/7] + 2 \text{Cos}[\pi/7]) \cdot \{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \text{Cos}[\alpha/2]\}\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}] / \text{norm}[\{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \text{Cos}[\alpha/2]\}\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}], \{n, 1, 7\} + \text{Table}[\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 2, 8\},$$

$$(7/7) \text{Table}[(2 \cdot \text{Cos}[3\pi/7] + 2 \text{Cos}[\pi/7]) \cdot \{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \text{Cos}[\alpha/2]\}\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}] / \text{norm}[\{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \text{Cos}[\alpha/2]\}\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}], \{n, 0, 6\}] + \text{Table}[2 \text{Cos}[\alpha/2] \cdot \{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \text{Cos}[\alpha/2]\}\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}], \{n, 0, 6\},$$

$$(7/7) \text{Table}[(1 + 2 \cdot \text{Cos}[4\pi/14]) \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}], \{n, 0, 6\}] + \text{Table}[\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 0, 6\}] + \text{Table}[\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 1, 7\},$$

$$(7/7) \text{Table}[(1 + 2 \cdot \text{Cos}[4\pi/14]) \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}], \{n, 0, 6\}] + \text{Table}[\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 0, 6\}] + \text{Table}[\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 6, 12\},$$

$$(8/8) \text{Table}[(2 \cdot \text{Cos}[3\pi/7] + 2 \text{Cos}[\pi/7]) \cdot \{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \text{Cos}[\alpha/2]\}\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}] / \text{norm}[\{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \text{Cos}[\alpha/2]\}\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}], \{n, 0, 6\}] + \text{Table}[2 \text{Cos}[\alpha/2] \cdot \{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \text{Cos}[\alpha/2]\}\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}], \{n, 0, 6\}] + \text{Table}[\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 2, 8\},$$

$$\begin{aligned}
 & (8/8) \text{Table}[(2*\text{Cos}[3*\text{Pi}/7] + \\
 & \quad 2 \text{Cos}[\text{Pi}/ \\
 & \quad 7])*({\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2], \\
 & \quad \text{Cos}[\text{al}[7]/2]\}}.\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\})/ \\
 & \text{norm}[({\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2], \\
 & \quad \text{Cos}[\text{al}[7]/2]\}}.\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\})], \{n, 0, \\
 & \quad 6\}] + \text{Table}[\\
 & \quad 2 \text{Cos}[\text{al}[7]/ \\
 & \quad 2])*({\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2], \\
 & \quad \text{Cos}[\text{al}[7]/2]\}}.\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}), \{n, 0, 6\}] + \\
 & \text{Table}[\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 6, 12\}],
 \end{aligned}$$

$$\begin{aligned}
 & (8/8) \\
 & \text{Table}[(1 + 2*\text{Cos}[4*\text{Pi}/14]) \{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 0, \\
 & \quad 6\}] + \text{Table}[\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 0, 6\}] + \\
 & \text{Table}[\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 1, 7\}] + \\
 & \text{Table}[\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 6, 12\}],
 \end{aligned}$$

$$\begin{aligned}
 & (9/9) \text{Table}[(2*\text{Cos}[3*\text{Pi}/7] + \\
 & \quad 2 \text{Cos}[\text{Pi}/ \\
 & \quad 7])*({\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2], \\
 & \quad \text{Cos}[\text{al}[7]/2]\}}.\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\})/ \\
 & \text{norm}[({\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2], \\
 & \quad \text{Cos}[\text{al}[7]/2]\}}.\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\})], \{n, 0, \\
 & \quad 6\}] + \text{Table}[\\
 & \quad 2 \text{Cos}[\text{al}[7]/ \\
 & \quad 2])*({\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2], \\
 & \quad \text{Cos}[\text{al}[7]/2]\}}.\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}), \{n, 0, 6\}] + \\
 & \text{Table}[\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 2, 8\}] + \\
 & \text{Table}[\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 1, 7\}],
 \end{aligned}$$

$$\begin{aligned}
 & (9/9) \text{Table}[(2*\text{Cos}[3*\text{Pi}/7] + \\
 & \quad 2 \text{Cos}[\text{Pi}/ \\
 & \quad 7])*({\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2], \\
 & \quad \text{Cos}[\text{al}[7]/2]\}}.\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\})/ \\
 & \text{norm}[({\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2], \\
 & \quad \text{Cos}[\text{al}[7]/2]\}}.\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\})], \{n, 0, \\
 & \quad 6\}] + \text{Table}[\\
 & \quad 2 \text{Cos}[\text{al}[7]/ \\
 & \quad 2])*({\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2], \\
 & \quad \text{Cos}[\text{al}[7]/2]\}}.\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}), \{n, 0, 6\}] + \\
 & \text{Table}[\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 6, 12\}] + \\
 & \text{Table}[\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 0, 6\}],
 \end{aligned}$$

(9/9)

$$\begin{aligned} & \text{Table}[(1 + 2 \cdot \cos[4 \cdot \pi/14]) \{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\}, \{n, 0, \\ & 6\}] + \text{Table}[\{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\}, \{n, 0, 6\}] + \\ & \text{Table}[\{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\}, \{n, 1, 7\}] + \\ & \text{Table}[\{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\}, \{n, 6, 12\}] + \\ & \text{Table}[\{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\}, \{n, 0, 6\}], \end{aligned}$$

(10/10) Table[(2 * Cos[3 * Pi/7] +

$$\begin{aligned} & 2 \cos[\pi/7]) * (\{\cos[a[7]/2], -\sin[a[7]/2]\}, \{\sin[a[7]/2], \\ & \cos[a[7]/2]\}) \cdot \{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\} / \\ & \text{norm}[(\{\cos[a[7]/2], -\sin[a[7]/2]\}, \{\sin[a[7]/2], \\ & \cos[a[7]/2]\}) \cdot \{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\}], \{n, 0, \\ & 6\}] + \\ & \text{Table}[2 \cos[a[7]/ \\ & 2] * (\{\cos[a[7]/2], -\sin[a[7]/2]\}, \{\sin[a[7]/2], \\ & \cos[a[7]/2]\}) \cdot \{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\}], \{n, 0, 6\}] + \\ & \text{Table}[\{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\}, \{n, 0, 6\}], \end{aligned}$$

(10/10) Table[(2 * Cos[3 * Pi/7] +

$$\begin{aligned} & 2 \cos[\pi/7]) * (\{\cos[a[7]/2], -\sin[a[7]/2]\}, \{\sin[a[7]/2], \\ & \cos[a[7]/2]\}) \cdot \{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\} / \\ & \text{norm}[(\{\cos[a[7]/2], -\sin[a[7]/2]\}, \{\sin[a[7]/2], \\ & \cos[a[7]/2]\}) \cdot \{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\}], \{n, 0, \\ & 6\}] + \text{Table}[\\ & 2 \cos[a[7]/ \\ & 2] * (\{\cos[a[7]/2], -\sin[a[7]/2]\}, \{\sin[a[7]/2], \\ & \cos[a[7]/2]\}) \cdot \{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\}], \{n, 0, 6\}] + \\ & \text{Table}[\{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\}, \{n, 1, 7\}], \end{aligned}$$

(11/11) Table[(2 * Cos[3 * Pi/7] +

$$\begin{aligned} & 2 \cos[\pi/7]) * (\{\cos[a[7]/2], -\sin[a[7]/2]\}, \{\sin[a[7]/2], \\ & \cos[a[7]/2]\}) \cdot \{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\} / \\ & \text{norm}[(\{\cos[a[7]/2], -\sin[a[7]/2]\}, \{\sin[a[7]/2], \\ & \cos[a[7]/2]\}) \cdot \{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\}], \{n, 0, \\ & 6\}] + \text{Table}[\\ & 2 \cos[a[7]/ \\ & 2] * (\{\cos[a[7]/2], -\sin[a[7]/2]\}, \{\sin[a[7]/2], \\ & \cos[a[7]/2]\}) \cdot \{\cos[n \cdot a[7]], \sin[n \cdot a[7]]\}], \{n, 0, 6\}] + \\ & \text{Table}[2 \cos[a[7]/ \end{aligned}$$

$$2] * (\{\{\cos[\alpha/2], -\sin[\alpha/2]\}, \{\sin[\alpha/2], \cos[\alpha/2]\}\} \cdot \{\cos[n\alpha], \sin[n\alpha]\}), \{n, 0, 6\},$$

(12/12)

$$\begin{aligned} & \text{Table}[(1 + 2\cos[4\pi/14]) \{\cos[n\alpha], \sin[n\alpha]\}, \{n, 0, 6\}] + \text{Table}[\{\cos[n\alpha], \sin[n\alpha]\}, \{n, 0, 6\}] + \\ & \text{Table}[\{\cos[n\alpha], \sin[n\alpha]\}, \{n, 1, 7\}] + \\ & \text{Table}[\{\cos[n\alpha], \sin[n\alpha]\}, \{n, 6, 12\}] + \\ & \text{Table}[\{\cos[n\alpha], \sin[n\alpha]\}, \{n, 0, 6\}] + \\ & \text{Table}[\{\cos[n\alpha], \sin[n\alpha]\}, \{n, 1, 7\}], \end{aligned}$$

(12/12)

$$\begin{aligned} & \text{Table}[(1 + 2\cos[4\pi/14]) \{\cos[n\alpha], \sin[n\alpha]\}, \{n, 0, 6\}] + \text{Table}[\{\cos[n\alpha], \sin[n\alpha]\}, \{n, 0, 6\}] + \\ & \text{Table}[\{\cos[n\alpha], \sin[n\alpha]\}, \{n, 1, 7\}] + \\ & \text{Table}[\{\cos[n\alpha], \sin[n\alpha]\}, \{n, 6, 12\}] + \\ & \text{Table}[\{\cos[n\alpha], \sin[n\alpha]\}, \{n, 0, 6\}] + \\ & \text{Table}[\{\cos[n\alpha], \sin[n\alpha]\}, \{n, 6, 12\}], \end{aligned}$$

(13/13) Table[(2*cos[3*Pi/7] +

$$\begin{aligned} & 2 \cos[\pi/7]) * (\{\{\cos[\alpha/2], -\sin[\alpha/2]\}, \{\sin[\alpha/2], \cos[\alpha/2]\}\} \cdot \{\cos[n\alpha], \sin[n\alpha]\}) / \\ & \text{norm}[\{\{\cos[\alpha/2], -\sin[\alpha/2]\}, \{\sin[\alpha/2], \cos[\alpha/2]\}\} \cdot \{\cos[n\alpha], \sin[n\alpha]\}], \{n, 0, 6\}] + \text{Table}[\\ & 2 \cos[\alpha/7] / \\ & 2] * (\{\{\cos[\alpha/2], -\sin[\alpha/2]\}, \{\sin[\alpha/2], \cos[\alpha/2]\}\} \cdot \{\cos[n\alpha], \sin[n\alpha]\}), \{n, 0, 6\}] + \\ & \text{Table}[2 \cos[\alpha/7] / \\ & 2] * (\{\{\cos[\alpha/2], -\sin[\alpha/2]\}, \{\sin[\alpha/2], \cos[\alpha/2]\}\} \cdot \{\cos[n\alpha], \sin[n\alpha]\}), \{n, 0, 6\}] + \\ & \text{Table}[\{\cos[n\alpha], \sin[n\alpha]\}, \{n, 2, 8\}], \end{aligned}$$

(13/13) Table[(2*cos[3*Pi/7] +

$$\begin{aligned} & 2 \cos[\pi/7]) * (\{\{\cos[\alpha/2], -\sin[\alpha/2]\}, \{\sin[\alpha/2], \cos[\alpha/2]\}\} \cdot \{\cos[n\alpha], \sin[n\alpha]\}) / \\ & \text{norm}[\{\{\cos[\alpha/2], -\sin[\alpha/2]\}, \{\sin[\alpha/2], \cos[\alpha/2]\}\} \cdot \{\cos[n\alpha], \sin[n\alpha]\}], \{n, 0, 6\}] + \text{Table}[\\ & 2 \cos[\alpha/7] / \\ & 2] * (\{\{\cos[\alpha/2], -\sin[\alpha/2]\}, \{\sin[\alpha/2], \cos[\alpha/2]\}\} \cdot \{\cos[n\alpha], \sin[n\alpha]\}), \{n, 0, 6\}], \end{aligned}$$

$$\begin{aligned} & \text{Cos}[a[7]/2] \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}[2 \text{ Cos}[a[7]/ \\ & 2] \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}[\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 6, 12\}], \end{aligned}$$

$$\begin{aligned} (14/14) & \text{Table}[(2 \cdot \text{Cos}[3 \cdot \text{Pi}/7] + \\ & 2 \text{ Cos}[\text{Pi}/ \\ & 7]) \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\} / \\ & \text{norm}[\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}], \{n, 0, \\ & 6\} + \text{Table}[\\ & 2 \text{ Cos}[a[7]/ \\ & 2] \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}[2 \text{ Cos}[a[7]/ \\ & 2] \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}[\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 2, 8\}] + \\ & \text{Table}[\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 2, 8\}], \end{aligned}$$

$$\begin{aligned} (14/14) & \text{Table}[(2 \cdot \text{Cos}[3 \cdot \text{Pi}/7] + \\ & 2 \text{ Cos}[\text{Pi}/ \\ & 7]) \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\} / \\ & \text{norm}[\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}], \{n, 0, \\ & 6\} + \text{Table}[\\ & 2 \text{ Cos}[a[7]/ \\ & 2] \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}[2 \text{ Cos}[a[7]/ \\ & 2] \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}[\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 2, 8\}] + \\ & \text{Table}[\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 6, 12\}], \end{aligned}$$

$$\begin{aligned} (14/14) & \text{Table}[(2 \cdot \text{Cos}[3 \cdot \text{Pi}/7] + \\ & 2 \text{ Cos}[\text{Pi}/ \\ & 7]) \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\} / \end{aligned}$$

$$\begin{aligned} & \text{norm}[\{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\ & \quad \text{Cos}[\alpha/2]\}\}\cdot\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}\}, \{n, 0, \\ & 6\}] + \text{Table}[\\ & 2 \text{Cos}[\alpha/ \\ & 2] * \{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\ & \quad \text{Cos}[\alpha/2]\}\}\cdot\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}\}, \{n, 0, 6\}] + \\ & \text{Table}[2 \text{Cos}[\alpha/ \\ & 2] * \{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\ & \quad \text{Cos}[\alpha/2]\}\}\cdot\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}\}, \{n, 0, 6\}] + \\ & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 6, 12\}\} + \\ & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 6, 12\}\}, \end{aligned}$$

(15/15)

$$\begin{aligned} & \text{Table}[(1 + 2 * \text{Cos}[4 * \text{Pi}/14]) \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 0, \\ & 6\}] + \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 0, 6\}\} + \\ & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 1, 7\}\} + \\ & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 6, 12\}\} + \\ & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 0, 6\}\} + \\ & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 1, 7\}\} + \\ & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 6, 12\}\}, \end{aligned}$$

(16/16) Table[(2 * Cos[3 * Pi/7] +

$$\begin{aligned} & 2 \text{Cos}[\text{Pi}/ \\ & 7]) * \{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\ & \quad \text{Cos}[\alpha/2]\}\}\cdot\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}\} / \\ & \text{norm}[\{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\ & \quad \text{Cos}[\alpha/2]\}\}\cdot\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}\}, \{n, 0, \\ & 6\}] + \text{Table}[\\ & 2 \text{Cos}[\alpha/ \\ & 2] * \{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\ & \quad \text{Cos}[\alpha/2]\}\}\cdot\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}\}, \{n, 0, 6\}] + \\ & \text{Table}[2 \text{Cos}[\alpha/ \\ & 2] * \{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\ & \quad \text{Cos}[\alpha/2]\}\}\cdot\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}\}, \{n, 0, 6\}] + \\ & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 2, 8\}\} + \\ & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 2, 8\}\} + \\ & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 1, 7\}\}, \end{aligned}$$

(16/16) Table[(2 * Cos[3 * Pi/7] +

$$\begin{aligned} & 2 \text{Cos}[\text{Pi}/ \\ & 7]) * \{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\ & \quad \text{Cos}[\alpha/2]\}\}\cdot\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}\} / \\ & \text{norm}[\{\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \end{aligned}$$

$$\begin{aligned} & \text{Cos}[a[7]/2]\}.{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]}, \{n, 0, \\ & 6\} + \text{Table}[\\ & 2 \text{Cos}[a[7]/ \\ & 2]*(\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\}.{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]}, \{n, 0, 6\} + \\ & \text{Table}[2 \text{Cos}[a[7]/ \\ & 2]*(\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\}.{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]}, \{n, 0, 6\} + \\ & \text{Table}\{\{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]\}, \{n, 2, 8\} + \\ & \text{Table}\{\{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]\}, \{n, 1, 7\}, \end{aligned}$$

$$\begin{aligned} (16/16) & \text{Table}[(2*\text{Cos}[3*\text{Pi}/7] + \\ & 2 \text{Cos}[\text{Pi}/ \\ & 7])* (\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\}.{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]})/ \\ & \text{norm}[(\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\}.{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]}), \{n, 0, \\ & 6\} + \text{Table}[\\ & 2 \text{Cos}[a[7]/ \\ & 2]*(\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\}.{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]}, \{n, 0, 6\} + \\ & \text{Table}[2 \text{Cos}[a[7]/ \\ & 2]*(\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\}.{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]}, \{n, 0, 6\} + \\ & \text{Table}\{\{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]\}, \{n, 2, 8\} + \\ & \text{Table}\{\{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]\}, \{n, 6, 12\} + \\ & \text{Table}\{\{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]\}, \{n, 1, 7\}, \end{aligned}$$

$$\begin{aligned} (16/16) & \text{Table}[(2*\text{Cos}[3*\text{Pi}/7] + \\ & 2 \text{Cos}[\text{Pi}/ \\ & 7])* (\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\}.{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]})/ \\ & \text{norm}[(\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\}.{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]}), \{n, 0, \\ & 6\} + \\ & \text{Table}[2 \text{Cos}[a[7]/ \\ & 2]*(\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\}.{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]}, \{n, 0, 6\} + \\ & \text{Table}[2 \text{Cos}[a[7]/ \\ & 2]*(\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\}.{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]}, \{n, 0, 6\} + \\ & \text{Table}\{\{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]\}, \{n, 2, 8\} + \\ & \text{Table}\{\{\text{Cos}[n*a[7]], \text{Sin}[n*a[7]]\}, \{n, 6, 12\} + \end{aligned}$$

Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}},

(17/17) Table[(2*Cos[3*Pi/7] +
 2 Cos[Pi/
 7])*{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}/
 norm[{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}], {n, 0,
 6}] + Table[
 2 Cos[al[7]/
 2]*{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}, {n, 0, 6}] +
 Table[2 Cos[al[7]/
 2]*{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}, {n, 0, 6}] +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 6, 12}] +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}},

(17/17) Table[(2*Cos[3*Pi/7] +
 2 Cos[Pi/
 7])*{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}/
 norm[{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}], {n, 0,
 6}] + Table[
 2 Cos[al[7]/
 2]*{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}, {n, 0, 6}] +
 Table[2 Cos[al[7]/
 2]*{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}, {n, 0, 6}] +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 6, 12}] +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 6, 12}] +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}},

(17/17)
 Table[(1 + 2*Cos[4*Pi/14]) {Cos[n*al[7]], Sin[n*al[7]]}, {n, 0,
 6}] + Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}] +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 1, 7}] +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 6, 12}] +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}] +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 1, 7}] +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 6, 12}] +

Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}},

(18/18) Table[(2*Cos[3*Pi/7] +
 2 Cos[Pi/
 7])*({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}).{Cos[n*al[7]], Sin[n*al[7]]})/
 norm[({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}).{Cos[n*al[7]], Sin[n*al[7]]})], {n, 0,
 6}] + Table[
 2 Cos[al[7]/
 2]*({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}).{Cos[n*al[7]], Sin[n*al[7]]}), {n, 0, 6}] +
 Table[2 Cos[al[7]/
 2]*({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}).{Cos[n*al[7]], Sin[n*al[7]]}), {n, 0, 6}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 2, 8}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 2, 8}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 1, 7}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}},

(18/18) Table[(2*Cos[3*Pi/7] +
 2 Cos[Pi/
 7])*({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}).{Cos[n*al[7]], Sin[n*al[7]]})/
 norm[({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}).{Cos[n*al[7]], Sin[n*al[7]]})], {n, 0,
 6}] + Table[
 2 Cos[al[7]/
 2]*({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}).{Cos[n*al[7]], Sin[n*al[7]]}), {n, 0, 6}] +
 Table[2 Cos[al[7]/
 2]*({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}).{Cos[n*al[7]], Sin[n*al[7]]}), {n, 0, 6}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 2, 8}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 1, 7}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}},

(18/18) Table[(2*Cos[3*Pi/7] +
 2 Cos[Pi/
 7])*({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}).{Cos[n*al[7]], Sin[n*al[7]]})/
 norm[({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}).{Cos[n*al[7]], Sin[n*al[7]]})], {n, 0,

$$\begin{aligned}
 & 6}] + \text{Table}[\\
 & 2 \text{Cos}[\alpha/7] / \\
 & 2] * (\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\
 & \text{Cos}[\alpha/2]\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}), \{n, 0, 6\} + \\
 & \text{Table}[2 \text{Cos}[\alpha/7] / \\
 & 2] * (\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\
 & \text{Cos}[\alpha/2]\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}), \{n, 0, 6\} + \\
 & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 2, 8\} + \\
 & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 6, 12\} + \\
 & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 1, 7\} + \\
 & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 0, 6\},
 \end{aligned}$$

$$\begin{aligned}
 (19/19) & \text{Table}[(2 * \text{Cos}[3\pi/7] + \\
 & 2 \text{Cos}[\pi/ \\
 & 7]) * (\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\
 & \text{Cos}[\alpha/2]\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}) / \\
 & \text{norm}[\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\
 & \text{Cos}[\alpha/2]\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}), \{n, 0, \\
 & 6\}] + \text{Table}[\\
 & 2 \text{Cos}[\alpha/7] / \\
 & 2] * (\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\
 & \text{Cos}[\alpha/2]\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}), \{n, 0, 6\} + \\
 & \text{Table}[2 \text{Cos}[\alpha/7] / \\
 & 2] * (\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\
 & \text{Cos}[\alpha/2]\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}), \{n, 0, 6\} + \\
 & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 6, 12\} + \\
 & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 0, 6\} + \\
 & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 1, 7\},
 \end{aligned}$$

$$\begin{aligned}
 (19/19) & \text{Table}[(2 * \text{Cos}[3\pi/7] + \\
 & 2 \text{Cos}[\pi/ \\
 & 7]) * (\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\
 & \text{Cos}[\alpha/2]\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}) / \\
 & \text{norm}[\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\
 & \text{Cos}[\alpha/2]\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}), \{n, 0, \\
 & 6\}] + \text{Table}[\\
 & 2 \text{Cos}[\alpha/7] / \\
 & 2] * (\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\
 & \text{Cos}[\alpha/2]\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}), \{n, 0, 6\} + \\
 & \text{Table}[2 \text{Cos}[\alpha/7] / \\
 & 2] * (\{\{\text{Cos}[\alpha/2], -\text{Sin}[\alpha/2]\}, \{\text{Sin}[\alpha/2], \\
 & \text{Cos}[\alpha/2]\}\} \cdot \{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}), \{n, 0, 6\} + \\
 & \text{Table}\{\{\text{Cos}[n\alpha], \text{Sin}[n\alpha]\}, \{n, 6, 12\} +
 \end{aligned}$$

$$\begin{aligned} & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 6, 12\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 0, 6\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 1, 7\}\}, \end{aligned}$$

(19/19)

$$\begin{aligned} & \text{Table}[(1 + 2*\text{Cos}[4*\text{Pi}/14]) \{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 0, \\ & 6\}] + \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 0, 6\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 1, 7\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 6, 12\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 0, 6\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 1, 7\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 6, 12\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 0, 6\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 1, 7\}\}, \end{aligned}$$

(19/19)

$$\begin{aligned} & \text{Table}[(1 + 2*\text{Cos}[4*\text{Pi}/14]) \{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 0, \\ & 6\}] + \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 0, 6\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 1, 7\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 6, 12\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 0, 6\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 1, 7\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 6, 12\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 0, 6\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 6, 12\}\}, \end{aligned}$$

(20/20) Table[(2*Cos[3*Pi/7] +

$$\begin{aligned} & 2 \text{Cos}[\text{Pi}/ \\ & 7]) * (\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} . \{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}) / \\ & \text{norm}[(\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} . \{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\})], \{n, 0, \\ & 6\}] + \text{Table}[\\ & 2 \text{Cos}[a[7]/ \\ & 2] * (\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} . \{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}), \{n, 0, 6\}] + \\ & \text{Table}[2 \text{Cos}[a[7]/ \\ & 2] * (\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} . \{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}), \{n, 0, 6\}] + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 2, 8\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 2, 8\}\} + \\ & \text{Table}\{\{\text{Cos}[n^*a[7]], \text{Sin}[n^*a[7]]\}, \{n, 1, 7\}\} + \end{aligned}$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 0, 6\}\} +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 2, 8\}\},$$

$$(20/20) \text{Table}[(2*\text{Cos}[3*\text{Pi}/7] +$$

$$2 \text{Cos}[\text{Pi}/$$

$$7]) * (\{\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2],$$

$$\text{Cos}[\text{al}[7]/2]\}\} . \{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}) /$$

$$\text{norm}[(\{\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2],$$

$$\text{Cos}[\text{al}[7]/2]\}\} . \{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\})], \{n, 0,$$

$$6\}] + \text{Table}[$$

$$2 \text{Cos}[\text{al}[7]/$$

$$2] * (\{\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2],$$

$$\text{Cos}[\text{al}[7]/2]\}\} . \{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}), \{n, 0, 6\}] +$$

$$\text{Table}[2 \text{Cos}[\text{al}[7]/$$

$$2] * (\{\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2],$$

$$\text{Cos}[\text{al}[7]/2]\}\} . \{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}), \{n, 0, 6\}] +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 6, 12\}\} +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 6, 12\}\} +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 0, 6\}\} +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 1, 7\}\} +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 6, 12\}\},$$

$$(20/20)$$

$$\text{Table}[(1 + 2*\text{Cos}[4*\text{Pi}/14]) \{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 0,$$

$$6\}] + \text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 0, 6\}\} +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 1, 7\}\} +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 6, 12\}\} +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 0, 6\}\} +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 1, 7\}\} +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 6, 12\}\} +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 0, 6\}\} +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 1, 7\}\} +$$

$$\text{Table}\{\{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}, \{n, 6, 12\}\},$$

$$(21/21) \text{Table}[(2*\text{Cos}[3*\text{Pi}/7] +$$

$$2 \text{Cos}[\text{Pi}/$$

$$7]) * (\{\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2],$$

$$\text{Cos}[\text{al}[7]/2]\}\} . \{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\}) /$$

$$\text{norm}[(\{\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2],$$

$$\text{Cos}[\text{al}[7]/2]\}\} . \{\text{Cos}[n*\text{al}[7]], \text{Sin}[n*\text{al}[7]]\})], \{n, 0,$$

$$6\}] + \text{Table}[$$

$$2 \text{Cos}[\text{al}[7]/$$

$$2] * (\{\{\text{Cos}[\text{al}[7]/2], -\text{Sin}[\text{al}[7]/2]\}, \{\text{Sin}[\text{al}[7]/2],$$

$$\begin{aligned} & \text{Cos}[a[7]/2] \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}[2 \text{ Cos}[a[7]/ \\ & 2] \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}\{\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 2, 8\} + \\ & \text{Table}\{\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 6, 12\} + \\ & \text{Table}\{\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 1, 7\} + \\ & \text{Table}\{\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}\{\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 2, 8\}, \end{aligned}$$

$$\begin{aligned} (21/21) & \text{Table}[(2 \cdot \text{Cos}[3 \cdot \text{Pi}/7] + \\ & 2 \text{ Cos}[\text{Pi}/ \\ & 7]) \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\} / \\ & \text{norm}[\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}], \{n, 0, \\ & 6\} + \text{Table}[\\ & 2 \text{ Cos}[a[7]/ \\ & 2] \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}[2 \text{ Cos}[a[7]/ \\ & 2] \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}\{\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 2, 8\} + \\ & \text{Table}\{\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 6, 12\} + \\ & \text{Table}\{\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 1, 7\} + \\ & \text{Table}\{\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}\{\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 1, 7\}, \end{aligned}$$

$$\begin{aligned} (21/21) & \text{Table}[(2 \cdot \text{Cos}[3 \cdot \text{Pi}/7] + \\ & 2 \text{ Cos}[\text{Pi}/ \\ & 7]) \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\} / \\ & \text{norm}[\{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}], \{n, 0, \\ & 6\} + \text{Table}[\\ & 2 \text{ Cos}[a[7]/ \\ & 2] \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}[2 \text{ Cos}[a[7]/ \\ & 2] \cdot \{\{\text{Cos}[a[7]/2], -\text{Sin}[a[7]/2]\}, \{\text{Sin}[a[7]/2], \\ & \text{Cos}[a[7]/2]\}\} \cdot \{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 0, 6\} + \\ & \text{Table}\{\{\text{Cos}[n \cdot a[7]], \text{Sin}[n \cdot a[7]]\}, \{n, 2, 8\} + \end{aligned}$$

Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 6, 12}} +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 1, 7}} +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}} +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}},

(21/21) Table[(2*Cos[3*Pi/7] +
 2 Cos[Pi/
 7])*{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}/
 norm[{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}})], {n, 0,
 6}] + Table[
 2 Cos[al[7]/
 2]*{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}, {n, 0, 6}] +
 Table[2 Cos[al[7]/
 2]*{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}, {n, 0, 6}] +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 2, 8}} +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 6, 12}} +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 1, 7}} +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}} +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 6, 12}},

(22/22) Table[(2*Cos[3*Pi/7] +
 2 Cos[Pi/
 7])*{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}/
 norm[{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}})], {n, 0,
 6}] + Table[
 2 Cos[al[7]/
 2]*{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}, {n, 0, 6}] +
 Table[2 Cos[al[7]/
 2]*{{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2]}}.{{Cos[n*al[7]], Sin[n*al[7]]}}, {n, 0, 6}] +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 2, 8}} +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 6, 12}} +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 1, 7}} +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}} +
 Table{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 1, 7}} +

Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 2, 8}},

(22/22) Table[(2*Cos[3*Pi/7] +
 2 Cos[Pi/
 7])*({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2}}}.{Cos[n*al[7]], Sin[n*al[7]]})/
 norm[({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2}}}.{Cos[n*al[7]], Sin[n*al[7]]}), {n, 0,
 6}] + Table[
 2 Cos[al[7]/
 2]*({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2}}}.{Cos[n*al[7]], Sin[n*al[7]]}), {n, 0, 6}] +
 Table[2 Cos[al[7]/
 2]*({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2}}}.{Cos[n*al[7]], Sin[n*al[7]]}), {n, 0, 6}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 2, 8}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 6, 12}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 1, 7}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 1, 7}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}],

(21/21) Table[(2*Cos[3*Pi/7] +
 2 Cos[Pi/
 7])*({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2}}}.{Cos[n*al[7]], Sin[n*al[7]]})/
 norm[({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2}}}.{Cos[n*al[7]], Sin[n*al[7]]}), {n, 0,
 6}] + Table[
 2 Cos[al[7]/
 2]*({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2}}}.{Cos[n*al[7]], Sin[n*al[7]]}), {n, 0, 6}] +
 Table[2 Cos[al[7]/
 2]*({{Cos[al[7]/2], -Sin[al[7]/2]}, {Sin[al[7]/2],
 Cos[al[7]/2}}}.{Cos[n*al[7]], Sin[n*al[7]]}), {n, 0, 6}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 2, 8}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 6, 12}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 1, 7}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 0, 6}] +
 Table[{{Cos[n*al[7]], Sin[n*al[7]]}, {n, 6, 12}]


```
],  
AspectRatio -> True, Axes -> False,  
PlotStyle -> {PointSize[0.02], Black}]
```