

Rings – 1 round

3v3

$$e^{-3i\gamma} (\cos^3(\beta) - i \sin^3(\beta)) + e^{i\gamma} (-3 \sin^2(\beta) \cos(\beta) + 3i \sin(\beta) \cos^2(\beta))$$

$$p = 0.999999999999678$$

3v2 1

$$e^{-3i\gamma} (-\sin^2(\beta) \cos(\beta) + i \sin(\beta) \cos^2(\beta)) + e^{i\gamma} (-i \sin^3(\beta) + \cos^3(\beta) + 2i \sin(\beta) \cos^2(\beta) - 2 \sin^2(\beta) \cos(\beta))$$

$$p = 0.999999999999996$$

4v4

$$e^{-4i\gamma} (\sin^4(\beta) + \cos^4(\beta)) - 2e^{4i\gamma} \sin^2(\beta) \cos^2(\beta) + 4i \sin(\beta) \cos^3(\beta) - 4 \sin^2(\beta) \cos^2(\beta) - 4i \sin^3(\beta) \cos(\beta)$$

$$p = 0.5398544578511101$$

4v3 1

$$e^{-4i\gamma} (i \sin(\beta) \cos^3(\beta) - i \sin^3(\beta) \cos(\beta)) + e^{4i\gamma} (i \sin(\beta) \cos^3(\beta) - i \sin^3(\beta) \cos(\beta)) \\ + \sin^4(\beta) + \cos^4(\beta) + 2i \sin(\beta) \cos^3(\beta) - 6 \sin^2(\beta) \cos^2(\beta) - 2i \sin^3(\beta) \cos(\beta)$$

$$p = 0.5$$

4v2 2

$$-2e^{-4i\gamma} \sin^2(\beta) \cos^2(\beta) - 2e^{4i\gamma} \sin^2(\beta) \cos^2(\beta) + \sin^4(\beta) + \cos^4(\beta) \\ + 4i \sin(\beta) \cos^3(\beta) - 2 \sin^2(\beta) \cos^2(\beta) - 4i \sin^3(\beta) \cos(\beta)$$

$$p = 0.4999999999999997$$

4v1 1 1 1

$$e^{4i\gamma} (\sin^4(\beta) + \cos^4(\beta)) - 2e^{-4i\gamma} \sin^2(\beta) \cos^2(\beta) + 4i \sin(\beta) \cos^3(\beta) - 4 \sin^2(\beta) \cos^2(\beta) - 4i \sin^3(\beta) \cos(\beta)$$

$$p = 0.5398544578511104$$

5v5

$$e^{-5i\gamma} (\cos^5(\beta) + i \sin^5(\beta)) + e^{3i\gamma} (-5 \sin^2(\beta) \cos^3(\beta) - 5i \sin^3(\beta) \cos^2(\beta)) \\ + e^{-i\gamma} (5i \sin(\beta) \cos^4(\beta) - 5 \sin^2(\beta) \cos^3(\beta) - 5i \sin^3(\beta) \cos^2(\beta) + 5 \sin^4(\beta) \cos(\beta))$$

$$p = 0.4105035493177127$$

5v4 1

$$e^{-5i\gamma} (\sin^4(\beta) \cos(\beta) + i \sin(\beta) \cos^4(\beta)) \\ + e^{3i\gamma} (2i \sin(\beta) \cos^4(\beta) - 3 \sin^2(\beta) \cos^3(\beta) - 3i \sin^3(\beta) \cos^2(\beta) + 2 \sin^4(\beta) \cos(\beta)) \\ + e^{-i\gamma} (i \sin^5(\beta) + \cos^5(\beta) + 2i \sin(\beta) \cos^4(\beta) - 7 \sin^2(\beta) \cos^3(\beta) - 7i \sin^3(\beta) \cos^2(\beta) + 2 \sin^4(\beta) \cos(\beta))$$

$$p = 0.3985485156786475$$

5v3 2

$$\begin{aligned} & e^{-5i\gamma} (-\sin^2(\beta) \cos^3(\beta) - i \sin^3(\beta) \cos^2(\beta)) \\ & + e^{3i\gamma} (i \sin(\beta) \cos^4(\beta) - 4 \sin^2(\beta) \cos^3(\beta) - 4i \sin^3(\beta) \cos^2(\beta) + \sin^4(\beta) \cos(\beta)) \\ & + e^{-i\gamma} (i \sin^5(\beta) + \cos^5(\beta) + 4i \sin(\beta) \cos^4(\beta) - 5 \sin^2(\beta) \cos^3(\beta) - 5i \sin^3(\beta) \cos^2(\beta) + 4 \sin^4(\beta) \cos(\beta)) \end{aligned}$$

p = 0.5150158139390923

5v2 1 1 1

$$\begin{aligned} & e^{-5i\gamma} (-\sin^2(\beta) \cos^3(\beta) - i \sin^3(\beta) \cos^2(\beta)) \\ & + e^{-i\gamma} (3i \sin(\beta) \cos^4(\beta) - 7 \sin^2(\beta) \cos^3(\beta) - 7i \sin^3(\beta) \cos^2(\beta) + 3 \sin^4(\beta) \cos(\beta)) \\ & + e^{3i\gamma} (i \sin^5(\beta) + \cos^5(\beta) + 2i \sin(\beta) \cos^4(\beta) - 2 \sin^2(\beta) \cos^3(\beta) - 2i \sin^3(\beta) \cos^2(\beta) + 2 \sin^4(\beta) \cos(\beta)) \end{aligned}$$

p = 0.8789062500000002

6v6

$$\begin{aligned} & e^{-6i\gamma} (\cos^6(\beta) - \sin^6(\beta)) - 2ie^{6i\gamma} \sin^3(\beta) \cos^3(\beta) \\ & + e^{2i\gamma} (-9 \sin^2(\beta) \cos^4(\beta) - 12i \sin^3(\beta) \cos^3(\beta) + 9 \sin^4(\beta) \cos^2(\beta)) \\ & + e^{-2i\gamma} (6i \sin(\beta) \cos^5(\beta) - 6 \sin^2(\beta) \cos^4(\beta) - 6i \sin^3(\beta) \cos^3(\beta) + 6 \sin^4(\beta) \cos^2(\beta) + 6i \sin^5(\beta) \cos(\beta)) \end{aligned}$$

p = 0.30171820009611067

6v5 1

$$\begin{aligned} & e^{-6i\gamma} (i \sin(\beta) \cos^5(\beta) + i \sin^5(\beta) \cos(\beta)) + e^{6i\gamma} (\sin^4(\beta) \cos^2(\beta) - \sin^2(\beta) \cos^4(\beta)) \\ & + e^{2i\gamma} (3i \sin(\beta) \cos^5(\beta) - 6 \sin^2(\beta) \cos^4(\beta) - 12i \sin^3(\beta) \cos^3(\beta) + 6 \sin^4(\beta) \cos^2(\beta) + 3i \sin^5(\beta) \cos(\beta)) \\ & + e^{-2i\gamma} (-\sin^6(\beta) + \cos^6(\beta) + 2i \sin(\beta) \cos^5(\beta) - 8 \sin^2(\beta) \cos^4(\beta) \\ & - 8i \sin^3(\beta) \cos^3(\beta) + 8 \sin^4(\beta) \cos^2(\beta) + 2i \sin^5(\beta) \cos(\beta)) \end{aligned}$$

p = 0.2621557189304736

6v4 2

$$\begin{aligned} & -2ie^{6i\gamma} \sin^3(\beta) \cos^3(\beta) + e^{-6i\gamma} (\sin^4(\beta) \cos^2(\beta) - \sin^2(\beta) \cos^4(\beta)) \\ & + e^{2i\gamma} (2i \sin(\beta) \cos^5(\beta) - 9 \sin^2(\beta) \cos^4(\beta) - 8i \sin^3(\beta) \cos^3(\beta) + 9 \sin^4(\beta) \cos^2(\beta) + 2i \sin^5(\beta) \cos(\beta)) \\ & + e^{-2i\gamma} (-\sin^6(\beta) + \cos^6(\beta) + 4i \sin(\beta) \cos^5(\beta) - 5 \sin^2(\beta) \cos^4(\beta) \\ & - 10i \sin^3(\beta) \cos^3(\beta) + 5 \sin^4(\beta) \cos^2(\beta) + 4i \sin^5(\beta) \cos(\beta)) \end{aligned}$$

p = 0.4260966260907454

6v3 1 1 1

$$\begin{aligned} & e^{6i\gamma} (i \sin(\beta) \cos^5(\beta) + i \sin^5(\beta) \cos(\beta)) + e^{-6i\gamma} (\sin^4(\beta) \cos^2(\beta) - \sin^2(\beta) \cos^4(\beta)) \\ & + e^{-2i\gamma} (3i \sin(\beta) \cos^5(\beta) - 6 \sin^2(\beta) \cos^4(\beta) - 12i \sin^3(\beta) \cos^3(\beta) + 6 \sin^4(\beta) \cos^2(\beta) \\ & + 3i \sin^5(\beta) \cos(\beta)) + e^{2i\gamma} (-\sin^6(\beta) + \cos^6(\beta) + 2i \sin(\beta) \cos^5(\beta) \\ & - 8 \sin^2(\beta) \cos^4(\beta) - 8i \sin^3(\beta) \cos^3(\beta) + 8 \sin^4(\beta) \cos^2(\beta) + 2i \sin^5(\beta) \cos(\beta)) \end{aligned}$$

p = 0.26215571893047385

6v3 3

$$\begin{aligned} & -2ie^{-6i\gamma} \sin^3(\beta) \cos^3(\beta) + e^{6i\gamma} (\sin^4(\beta) \cos^2(\beta) - \sin^2(\beta) \cos^4(\beta)) \\ & + e^{2i\gamma} (2i \sin(\beta) \cos^5(\beta) - 6 \sin^2(\beta) \cos^4(\beta) - 14i \sin^3(\beta) \cos^3(\beta) + 6 \sin^4(\beta) \cos^2(\beta) + 2i \sin^5(\beta) \cos(\beta)) \\ & + e^{-2i\gamma} (-\sin^6(\beta) + \cos^6(\beta) + 4i \sin(\beta) \cos^5(\beta) - 8 \sin^2(\beta) \cos^4(\beta) \\ & - 4i \sin^3(\beta) \cos^3(\beta) + 8 \sin^4(\beta) \cos^2(\beta) + 4i \sin^5(\beta) \cos(\beta)) \end{aligned}$$

p = 0.37500000000000017

6v2 1 2 1

$$\begin{aligned} & -2ie^{6i\gamma} \sin^3(\beta) \cos^3(\beta) + e^{-6i\gamma} (\sin^4(\beta) \cos^2(\beta) - \sin^2(\beta) \cos^4(\beta)) \\ & + e^{-2i\gamma} (2i \sin(\beta) \cos^5(\beta) - 6 \sin^2(\beta) \cos^4(\beta) - 14i \sin^3(\beta) \cos^3(\beta) + 6 \sin^4(\beta) \cos^2(\beta) \\ & + 2i \sin^5(\beta) \cos(\beta)) + e^{2i\gamma} (-\sin^6(\beta) + \cos^6(\beta) + 4i \sin(\beta) \cos^5(\beta) \\ & - 8 \sin^2(\beta) \cos^4(\beta) - 4i \sin^3(\beta) \cos^3(\beta) + 8 \sin^4(\beta) \cos^2(\beta) + 4i \sin^5(\beta) \cos(\beta)) \end{aligned}$$

p = 0.37499999999999933

6v2 1 1 2

$$\begin{aligned} & -2ie^{-6i\gamma} \sin^3(\beta) \cos^3(\beta) + e^{6i\gamma} (\sin^4(\beta) \cos^2(\beta) - \sin^2(\beta) \cos^4(\beta)) \\ & + e^{-2i\gamma} (2i \sin(\beta) \cos^5(\beta) - 9 \sin^2(\beta) \cos^4(\beta) - 8i \sin^3(\beta) \cos^3(\beta) + 9 \sin^4(\beta) \cos^2(\beta) + 2i \sin^5(\beta) \cos(\beta)) \\ & + e^{2i\gamma} (-\sin^6(\beta) + \cos^6(\beta) + 4i \sin(\beta) \cos^5(\beta) - 5 \sin^2(\beta) \cos^4(\beta) \\ & - 10i \sin^3(\beta) \cos^3(\beta) + 5 \sin^4(\beta) \cos^2(\beta) + 4i \sin^5(\beta) \cos(\beta)) \end{aligned}$$

p = 0.4260966260907456

6v1 1 1 1 1 1

$$\begin{aligned} & e^{6i\gamma} (\cos^6(\beta) - \sin^6(\beta)) - 2ie^{-6i\gamma} \sin^3(\beta) \cos^3(\beta) \\ & + e^{-2i\gamma} (-9 \sin^2(\beta) \cos^4(\beta) - 12i \sin^3(\beta) \cos^3(\beta) + 9 \sin^4(\beta) \cos^2(\beta)) \\ & + e^{2i\gamma} (6i \sin(\beta) \cos^5(\beta) - 6 \sin^2(\beta) \cos^4(\beta) - 6i \sin^3(\beta) \cos^3(\beta) + 6 \sin^4(\beta) \cos^2(\beta) + 6i \sin^5(\beta) \cos(\beta)) \end{aligned}$$

p = 0.3017182000961104