Rings − 2 rounds different

3v3

$$\left(e^{\frac{i\gamma 2}{2}}\left(-3\sin^2(\beta 2)\cos(\beta 2)\right.\right.$$
$$+3i\sin(\beta 2)\cos^2(\beta 2)\Big)\left(e^{-\frac{3i\gamma 1}{2}}\left(-\sin^2(\beta 1)\cos(\beta 1)+i\sin(\beta 1)\cos^2(\beta 1)\right)\right.$$
$$\left.+e^{\frac{i\gamma 1}{2}}\left(-i\sin^3(\beta 1)+\cos^3(\beta 1)+2i\sin(\beta 1)\cos^2(\beta 1)-2\sin^2(\beta 1)\cos(\beta 1)\right)\right)$$
$$+e^{-\frac{3i\gamma 2}{2}}\left(\cos^3(\beta 2)-i\sin^3(\beta 2)\right)\left(e^{-\frac{3i\gamma 1}{2}}\left(\cos^3(\beta 1)-i\sin^3(\beta 1)\right)\right.$$
$$\left.\left.+e^{\frac{i\gamma 1}{2}}\left(-3\sin^2(\beta 1)\cos(\beta 1)+3i\sin(\beta 1)\cos^2(\beta 1)\right)\right)\right)\left(e^{-\frac{i\gamma 2}{2}}\left(-3\sin^2(\beta 2)\cos(\beta 2)\right.\right.$$
$$-3i\sin(\beta 2)\cos^2(\beta 2)\Big)\left(e^{\frac{3i\gamma 1}{2}}\left(-\sin^2(\beta 1)\cos(\beta 1)-i\sin(\beta 1)\cos^2(\beta 1)\right)\right.$$
$$\left.+e^{-\frac{i\gamma 1}{2}}\left(i\sin^3(\beta 1)+\cos^3(\beta 1)-2i\sin(\beta 1)\cos^2(\beta 1)-2\sin^2(\beta 1)\cos(\beta 1)\right)\right)$$
$$+e^{\frac{3i\gamma 2}{2}}\left(\cos^3(\beta 2)+i\sin^3(\beta 2)\right)\left(e^{\frac{3i\gamma 1}{2}}\left(\cos^3(\beta 1)+i\sin^3(\beta 1)\right)\right.$$
$$\left.\left.+e^{-\frac{i\gamma 1}{2}}\left(-3\sin^2(\beta 1)\cos(\beta 1)-3i\sin(\beta 1)\cos^2(\beta 1)\right)\right)\right)$$

p = 1.0000000000000002

3v2 1

$$\left(e^{-\frac{3i\gamma 2}{2}}\left(-\sin^2(\beta 2)\cos(\beta 2)+i\sin(\beta 2)\cos^2(\beta 2)\right)\left(e^{-\frac{3i\gamma 1}{2}}\left(\cos^3(\beta 1)-i\sin^3(\beta 1)\right)\right.\right.$$
$$\left.+e^{\frac{i\gamma 1}{2}}\left(-3\sin^2(\beta 1)\cos(\beta 1)+3i\sin(\beta 1)\cos^2(\beta 1)\right)\right)+e^{\frac{i\gamma 2}{2}}\left(-i\sin^3(\beta 2)+\cos^3(\beta 2)\right.$$
$$+2i\sin(\beta 2)\cos^2(\beta 2)-2\sin^2(\beta 2)\cos(\beta 2)\Big)\left(e^{-\frac{3i\gamma 1}{2}}\left(-\sin^2(\beta 1)\cos(\beta 1)+i\sin(\beta 1)\cos^2(\beta 1)\right)\right.$$
$$\left.\left.+e^{\frac{i\gamma 1}{2}}\left(-i\sin^3(\beta 1)+\cos^3(\beta 1)+2i\sin(\beta 1)\cos^2(\beta 1)-2\sin^2(\beta 1)\cos(\beta 1)\right)\right)\right)\left(e^{\frac{3i\gamma 2}{2}}\left(-\sin^2(\beta 2)\cos(\beta 2)\right.\right.$$
$$-i\sin(\beta 2)\cos^2(\beta 2)\Big)\left(e^{\frac{3i\gamma 1}{2}}\left(\cos^3(\beta 1)+i\sin^3(\beta 1)\right)+e^{-\frac{i\gamma 1}{2}}\left(-3\sin^2(\beta 1)\cos(\beta 1)-3i\sin(\beta 1)\cos^2(\beta 1)\right)\right)$$
$$+e^{-\frac{i\gamma 2}{2}}\left(i\sin^3(\beta 2)+\cos^3(\beta 2)-2i\sin(\beta 2)\cos^2(\beta 2)\right.$$
$$-2\sin^2(\beta 2)\cos(\beta 2)\Big)\left(e^{\frac{3i\gamma 1}{2}}\left(-\sin^2(\beta 1)\cos(\beta 1)-i\sin(\beta 1)\cos^2(\beta 1)\right)\right.$$
$$\left.\left.+e^{-\frac{i\gamma 1}{2}}\left(i\sin^3(\beta 1)+\cos^3(\beta 1)-2i\sin(\beta 1)\cos^2(\beta 1)-2\sin^2(\beta 1)\cos(\beta 1)\right)\right)\right)$$

p = 1.0000000000000004

4v4

$$\Big(-2e^{2i\gamma 2}\sin^2(\beta 2)\cos^2(\beta 2)\left(e^{2i\gamma 1}\left(\sin^4(\beta 1)+\cos^4(\beta 1)\right)-2e^{-2i\gamma 1}\sin^2(\beta 1)\cos^2(\beta 1)+4i\sin(\beta 1)\cos^3(\beta 1)\right.$$
$$\left.-4\sin^2(\beta 1)\cos^2(\beta 1)-4i\sin^3(\beta 1)\cos(\beta 1)\right)+e^{-2i\gamma 2}\left(\sin^4(\beta 2)+\cos^4(\beta 2)\right)\Big(e^{-2i\gamma 1}\left(\sin^4(\beta 1)+\cos^4(\beta 1)\right)$$
$$-2e^{2i\gamma 1}\sin^2(\beta 1)\cos^2(\beta 1)+4i\sin(\beta 1)\cos^3(\beta 1)-4\sin^2(\beta 1)\cos^2(\beta 1)-4i\sin^3(\beta 1)\cos(\beta 1)\Big)$$
$$-4\sin^2(\beta 2)\cos^2(\beta 2)\Big(-2e^{-2i\gamma 1}\sin^2(\beta 1)\cos^2(\beta 1)-2e^{2i\gamma 1}\sin^2(\beta 1)\cos^2(\beta 1)$$
$$+\sin^4(\beta 1)+\cos^4(\beta 1)+4i\sin(\beta 1)\cos^3(\beta 1)-2\sin^2(\beta 1)\cos^2(\beta 1)-4i\sin^3(\beta 1)\cos(\beta 1)\Big)$$
$$+\left(4i\sin(\beta 2)\cos^3(\beta 2)-4i\sin^3(\beta 2)\cos(\beta 2)\right)\Big(e^{-2i\gamma 1}\left(i\sin(\beta 1)\cos^3(\beta 1)-i\sin^3(\beta 1)\cos(\beta 1)\right)$$
$$+e^{2i\gamma 1}\left(i\sin(\beta 1)\cos^3(\beta 1)-i\sin^3(\beta 1)\cos(\beta 1)\right)+\sin^4(\beta 1)+\cos^4(\beta 1)+2i\sin(\beta 1)\cos^3(\beta 1)$$
$$-6\sin^2(\beta 1)\cos^2(\beta 1)-2i\sin^3(\beta 1)\cos(\beta 1)\Big)\Big)\Big(-2e^{-2i\gamma 2}\sin^2(\beta 2)\cos^2(\beta 2)\Big(e^{-2i\gamma 1}\left(\sin^4(\beta 1)+\cos^4(\beta 1)\right)$$
$$-2e^{2i\gamma 1}\sin^2(\beta 1)\cos^2(\beta 1)-4i\sin(\beta 1)\cos^3(\beta 1)-4\sin^2(\beta 1)\cos^2(\beta 1)+4i\sin^3(\beta 1)\cos(\beta 1)\Big)$$
$$+e^{2i\gamma 2}\left(\sin^4(\beta 2)+\cos^4(\beta 2)\right)\Big(e^{2i\gamma 1}\left(\sin^4(\beta 1)+\cos^4(\beta 1)\right)-2e^{-2i\gamma 1}\sin^2(\beta 1)\cos^2(\beta 1)$$
$$-4i\sin(\beta 1)\cos^3(\beta 1)-4\sin^2(\beta 1)\cos^2(\beta 1)+4i\sin^3(\beta 1)\cos(\beta 1)\Big)$$
$$-4\sin^2(\beta 2)\cos^2(\beta 2)\Big(-2e^{-2i\gamma 1}\sin^2(\beta 1)\cos^2(\beta 1)-2e^{2i\gamma 1}\sin^2(\beta 1)\cos^2(\beta 1)$$
$$+\sin^4(\beta 1)+\cos^4(\beta 1)-4i\sin(\beta 1)\cos^3(\beta 1)-2\sin^2(\beta 1)\cos^2(\beta 1)+4i\sin^3(\beta 1)\cos(\beta 1)\Big)$$
$$+\left(4i\sin^3(\beta 2)\cos(\beta 2)-4i\sin(\beta 2)\cos^3(\beta 2)\right)\Big(e^{-2i\gamma 1}\left(i\sin^3(\beta 1)\cos(\beta 1)-i\sin(\beta 1)\cos^3(\beta 1)\right)$$
$$+e^{2i\gamma 1}\left(i\sin^3(\beta 1)\cos(\beta 1)-i\sin(\beta 1)\cos^3(\beta 1)\right)+\sin^4(\beta 1)+\cos^4(\beta 1)-2i\sin(\beta 1)\cos^3(\beta 1)-6\sin^2(\beta 1)\cos^2(\beta 1)+2i\sin^3(\beta 1)$$

p = 1.0000000000000004