$$\sum_{n=0}^{\infty}\frac{(4n)!}{4^{4n}\cdot n!^4}\frac{(186\sqrt{2}+151\sqrt{3})+(3780\sqrt{2}+3080\sqrt{3})\cdot n}{(825+336\sqrt{6})^{2n+1}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}\frac{(4n)!}{4^{4n}\cdot n!^4}\frac{\sqrt{3}(4302\sqrt{2}+12161/2)+(\sqrt{3}(119340\sqrt{2}+168740))\cdot n}{(33099+23400\sqrt{2})^{2n+1}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}\frac{(4n)!}{4^{4n}\cdot n!^4}\frac{\sqrt{7}(1356\sqrt{2}+1715/2\sqrt{5})+(\sqrt{7}(35640\sqrt{2}+22540\sqrt{5}))\cdot n}{(15939+5040\sqrt{10})^{2n+1}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}(-1)^n\frac{(4n)!}{4^{4n}\cdot n!^4}\frac{(1781017/2\sqrt{177}+47389527/4)+(37219780\sqrt{177}+495176085)\cdot n}{(21488850\sqrt{3}+4845594\sqrt{59})^{2n+1}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}\frac{(6n)!}{(3n)!\cdot n!^3\cdot 1728^n}\cdot\frac{(30282810\sqrt{29}+163073763)+(1449063000\sqrt{29}+7803343548)\cdot n}{(174979733174158375+32492920723263000\sqrt{29})^{n+1/2}}=\frac{\sqrt{3}}{\pi}$$

$$\sum_{n=0}^{\infty}\frac{(6n)!}{(3n)!\cdot n!^3\cdot 1728^n}\cdot\frac{(16659+11750\sqrt{2})+(490644+346500\sqrt{2})\cdot n}{(1821424375+1287940500\sqrt{2})^{n+1/2}}=\frac{\sqrt{3}}{\pi}$$

$$\sum_{n=0}^{\infty}\frac{(4n)!}{4^{4n}\cdot n!^4}\frac{\sqrt{2}(117046\sqrt{13}+188730\sqrt{5})+(\sqrt{2}(4192540\sqrt{13}+6760260\sqrt{5}))\cdot n}{(1874961+232560\sqrt{65})^{2n+1}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}\frac{(6n)!}{(3n)!\cdot n!^3\cdot 1728^n}\cdot\frac{(62\sqrt{5}+135)+(1224\sqrt{5}+2700)\cdot n}{(123175+55080\sqrt{5})^{n+1/2}}=\frac{\sqrt{3}}{\pi}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(4n)!}{4^{4n}\cdot n!^4}\frac{(212750712\sqrt{11}+2822457127/4)+(10631172240\sqrt{11}+35259609385)\cdot n}{(2216752650+668376072\sqrt{11})^{2n+1}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}\frac{(6n)!}{(3n)!\cdot n!^3\cdot 1728^n}\cdot\frac{(15+10\sqrt{2})+(228+156\sqrt{2})\cdot n}{(1399+988\sqrt{2})^{n+1/2}}=\frac{\sqrt{3}}{\pi}$$

$$\sum_{n=0}^{\infty}\frac{(3n)!\cdot(2n)!}{n!^5}\cdot\frac{4+33\cdot n}{108^n}\cdot\left(\frac{4}{125}\right)^n=\frac{1}{\pi}\cdot\frac{15\sqrt{3}}{2}$$

$$\sum_{n=0}^{\infty}\binom{2n}{n}^3\cdot\frac{(5\sqrt{5}-1)+(42\sqrt{5}+30)\cdot n}{(\sqrt{5}+1)^{8n}\cdot 16^n}=\frac{32}{\pi}$$

$$\sum_{n=0}^{\infty}\frac{(3n)!\cdot(2n)!}{n!^5}\cdot\frac{2+15\cdot n}{108^n}\cdot\left(\frac{2}{27}\right)^n=\frac{1}{\pi}\cdot\frac{27}{4}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\binom{2n}{n}^3\cdot\frac{(7-2\sqrt{6})+28\cdot n}{(\sqrt{3}-\sqrt{2})^{8n+2}\cdot 4^n}=\frac{2}{3\pi}$$

$$\sum_{n=0}^{\infty}\frac{(6n)!}{(3n)!\cdot n!^3}\cdot\frac{8+133\cdot n}{1728^n}\cdot\left(\frac{4}{85}\right)^{3n}=\frac{1}{\pi}\cdot\frac{85\sqrt{85}}{18\sqrt{3}}$$

$$\sum_{n=0}^{\infty}\binom{2n}{n}^3\cdot\frac{5+42\cdot n}{4096^n}=\frac{16}{\pi}$$

$$\sum_{n=0}^{\infty}\binom{2n}{n}^3\cdot\frac{1+6\cdot n}{256^n}=\frac{4}{\pi}$$

$$\sum_{n=0}^{\infty}\frac{(6n)!}{(3n)!\cdot n!^3}\cdot\frac{1+11\cdot n}{1728^n}\cdot\left(\frac{4}{125}\right)^n=\frac{1}{\pi}\cdot\frac{5\sqrt{5}}{2\sqrt{3}}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\binom{2n}{n}^3\cdot\frac{1+4\cdot n}{4^n}=\frac{2}{\pi}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(6n)!}{(3n)!\cdot n!^3}\cdot\frac{9468+195048\cdot n}{(884736000)^{n+1/2}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(6n)!}{(3n)!\cdot n!^3}\cdot\frac{24+189\cdot n}{(3375)^{n+1/2}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(6n)!}{(3n)!\cdot n!^3}\cdot\frac{122124+3140424\cdot n}{(147197952000)^{n+1/2}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(6n)!}{(3n)!\cdot n!^3}\cdot\frac{60+616\cdot n}{(32768)^{n+1/2}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(6n)!}{(3n)!\cdot n!^3}\cdot\frac{300+4104\cdot n}{(884736)^{n+1/2}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(6n)!}{(3n)!\cdot n!^3}\cdot\frac{163096908+6541681608\cdot n}{(262537412640768000)^{n+1/2}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(6n)!}{(3n)!\cdot n!^3}\cdot\frac{1116+18216\cdot n}{(12288000)^{n+1/2}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}\frac{(4n)!}{4^{4n}\cdot n!^4}\cdot\frac{1103+26390\cdot n}{(9801)^{2n+1}}=\frac{1}{\pi}\cdot\frac{2}{2\sqrt{2}}$$

$$\sum_{n=0}^{\infty}\frac{(4n)!}{4^{4n}\cdot n!^4}\cdot\frac{19+280\cdot n}{(99)^{2n+1}}=\frac{1}{\pi}\cdot\frac{2}{\sqrt{11}}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(4n)!}{4^{4n}\cdot n!^4}\cdot\frac{1123+21460\cdot n}{(882)^{2n+1}}=\frac{4}{\pi}$$

$$\sum_{n=0}^{\infty}\frac{(4n)!}{4^{4n}\cdot n!^4}\cdot\frac{3+40\cdot n}{(49)^{2n+1}}=\frac{1}{\pi}\cdot\frac{1}{3\sqrt{3}}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(4n)!}{4^{4n}\cdot n!^4}\cdot\frac{23+260\cdot n}{(18)^{2n+1}}=\frac{4}{\pi}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(4n)!}{4^{4n}\cdot n!^4}\cdot\frac{3+20\cdot n}{2^{2n+1}}=\frac{4}{\pi}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(4n)!}{4^{4n}\cdot n!^4}\cdot\frac{3+28\cdot n}{3^n\cdot 4^{2n+1}}=\frac{1}{\pi}\cdot\frac{4}{\sqrt{3}}$$

$$\sum_{n=0}^{\infty}\frac{(4n)!}{4^{4n}\cdot n!^4}\cdot\frac{1+10\cdot n}{9^{2n+1}}=\frac{1}{\pi}\cdot\frac{1}{2\sqrt{2}}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(4n)!}{4^{4n}\cdot n!^4}\cdot\frac{41+644\cdot n}{5^n\cdot(72)^{2n+1}}=\frac{1}{\pi}\cdot\frac{4}{\sqrt{5}}$$

$$\sum_{n=0}^{\infty}\frac{(4n)!}{4^{4n}\cdot n!^4}\cdot\frac{1+8\cdot n}{3^{2n+1}}=\frac{1}{\pi}\cdot\frac{2}{\sqrt{3}}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(6n)!}{(3n)!\cdot n!^3\cdot 1728^n}\cdot\frac{(197238000\sqrt{89}+1860739157)+(10125024000\sqrt{89}+95519278302)\cdot n}{(5695339078148000000+603704734875424000\sqrt{89})^{n+1/2}}=\frac{2\sqrt{3}}{\pi}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(6n)!}{(3n)!\cdot n!^3\cdot 1728^n}\cdot\frac{(212175710912\sqrt{61}+1657145277365)+(13773980892672\sqrt{61}+107578229802750)\cdot n}{(4517203562651557847168000+578368650183667447104000\sqrt{61})^{n+1/2}}=\frac{2\sqrt{3}}{\pi}$$

$$\sum_{n=0}^{\infty}\frac{(4n)!}{4^{4n}\cdot n!^4}\frac{\sqrt{19}(11552301/2+4084354\sqrt{2})+(\sqrt{19}(250129620+176868340\sqrt{2}))\cdot n}{(79097931+55930680\sqrt{2})^{2n+1}}=\frac{1}{\pi}$$

$$\sum_{n=0}^{\infty}(-1)^n\cdot\frac{(6n)!}{(3n)!\cdot n!^3\cdot 1728^n}\cdot\frac{(380527125+170176896\sqrt{5})+(18326073150+8195668992\sqrt{5})\cdot n}{(238187910720320000+106520871957857280\sqrt{5})^{n+1/2}}=\frac{2\sqrt{3}}{\pi}$$

$$\sum_{n=0}^{\infty}\left(\frac{8}{3}\right)^n\frac{(-245n+338)}{\binom{3n}{n}}=162-6\pi\sqrt{3}-18\ln 3$$

$$\sum_{n=0}^{\infty}\left(-\frac{27}{16}\right)^n\frac{(-90n-177)}{\binom{3n}{n}}=64\ln 2-120$$

$$\sum_{n=0}^{\infty}\left(\frac{8}{3}\right)^n\frac{(49n+1)}{\binom{3n}{n}}=16\pi\sqrt{3}+81$$

$$\sum_{n=1}^{\infty}\left(-\frac{1}{8}\right)^n\frac{(113930-482295n+769825n^2)}{\binom{4n}{n}}=-2880\ln 2-9354$$

$$\sum_{n=1}^{\infty}\frac{(13+675n-242n^2)5^n}{\binom{4n}{n}}=-1005+\pi\left(-144\sqrt{5+2\sqrt{5}}+12\sqrt{5-2\sqrt{5}}\right)$$

$$\sum_{n=0}^{\infty}\left(-\frac{8}{9}\right)^n\frac{(3575n+1999)}{\binom{3n}{n}}=1215-432\ln 3$$

$$\sum_{n=1}^{\infty}\left(\frac{32}{27}\right)^n\frac{(848924-6992570n+8351757n^2-836163n^3)}{\binom{5n}{2n}}=7776\pi\sqrt{3}+12960\ln 3+208576$$

$$\sum_{n=0}^{\infty}\frac{(50n-6)}{2^n\binom{3n}{n}}=\pi$$

$$\sum_{n=1}^{\infty}\frac{(-46-1557n+363n^2)5^n}{\binom{4n}{n}}=-450+\pi\left(-108\sqrt{5+2\sqrt{5}}+12\sqrt{5-2\sqrt{5}}\right)$$

$$\sum_{n=0}^{\infty}\frac{(275n-158)}{2^n\binom{3n}{n}}=6\ln 2-135$$

$$\sum_{n=0}^{\infty}\frac{(-1)^n(17-728n)}{4^n\binom{3n}{n}}=24\ln 2+54$$

$$\sum_{n=1}^{\infty}\frac{(-27)^n(2n)!^2(3n)!(1080n-81)}{(6n)!n!}=-40\pi\sqrt{3}-243$$

$$\sum_{n=0}^{\infty}\frac{8^n(2n)!^2(3n)!(350n-17)}{(6n)!n!}=15\pi\sqrt{2}+27$$

$$\sum_{n=1}^{\infty}\frac{(-4)^n(2n)!^2(3n)!(952n-201)}{(6n)!n!}=-15\pi-42$$

$$\sum_{n=1}^{\infty}\frac{32^n}{3^n\binom{5n}{n}}(-784740-982465n-8710065n^2+338338n^3)=-288\pi\sqrt{3}+7200\ln 3+522240$$

$$\sum_{n=1}^{\infty}\frac{32^n}{3^n\binom{5n}{n}}(1091838+10106527n+1624028n^2-83993n^3)=24000\pi\sqrt{3}-8640\ln 3-1913088$$

$$\sum_{n=1}^{\infty}\left(-\frac{1}{2}\right)^n\frac{(3028+482n-77362n^2+89012n^3)}{\binom{5n}{2n}}=240\ln 2+15\pi-528$$

$$\sum_{n=1}^{\infty}\left(-\frac{1}{2}\right)^n\frac{(32132-168944n+32425n^2+117623n^3)}{\binom{5n}{2n}}=1080\ln 2+99\pi-882$$

$$\sum_{n=1}^{\infty}\left(\frac{32}{27}\right)^n\frac{(-1712038+16186499n+8143299n^2-25786188n^3)}{\binom{5n}{2n}}=-39456\pi\sqrt{3}-38880\ln 3-1291712$$

$$\sum_{n=1}^{\infty}\frac{(-1)^n(406438368-2590474754n+12650685833n^2-17378153839n^3+5945803687n^4+7653973665n^5)}{\binom{7n}{2n}}=-95680\pi\sqrt{3}-105237720$$

$$\sum_{n=1}^{\infty}\frac{(-1)^n(-64842436+404508358n-3636433048n^2+3576295224n^3-7721398924n^4-10677373750n^5)}{8^n\binom{7n}{n}}=9295605\pi+443520\ln 2+221195556$$

$$\sum_{n=1}^{\infty}\frac{(-1)^n\cdot(-661964844+5822558020n+4409489423n^2-112967629336n^3+200018966059n^4-100432635534n^5)}{3^n\binom{7n}{2n}}=-309360\pi\sqrt{3}-7121520\ln 3-21225300$$

$$\sum_{n=1}^{\infty}\frac{(-1)^n\cdot(1547197248-19409686126n+62909874503n^2-44354527881n^3-33540887303n^4+31344537367n^5)}{3^n\binom{7n}{2n}}=404640\pi\sqrt{3}+7771680\ln 3+46509720$$

$$\sum_{n=1}^{\infty}\frac{-445972888428-914545693862n-2457527102410n^2-21157350167325n^3+31034117936737n^4+12510561428099n^5-9270025279707n^6}{\binom{8n}{n}}=7484757280\pi\sqrt{3}+569384415852$$

$$\sum_{n=1}^{\infty}\frac{79371060090+148314047723n+1480383303223n^2+5565398860353n^3-2545104522979n^4+17229124728424n^5-8645263491354n^6}{\binom{8n}{n}}=1150349200\pi\sqrt{3}+7341293190$$

$$\sum_{n=1}^{\infty}\frac{81^n(-144899676050352+1723435250213140n-12094202937665912n^2+21715844958700375n^3-24669518654481983n^4+2187461598670285n^5+3025940469790447n^6)}{8^n\binom{8n}{3n}}=-38799129600\pi\sqrt{3}+1153914854400\ln 2+20185391283120$$

$$\sum_{n=1}^{\infty}\frac{(-1)^n(51406-196341n+246323n^2)}{2^n\binom{4n}{n}}=-720\ln 2-7278$$

$$\sum_{n=1}^{\infty}\left(-\frac{1}{16}\right)^n\frac{(-3810109+48164564n-132390804n^2+126626274n^3)}{\binom{5n}{n}}=-73920\ln 2-382391$$

$$\sum_{n=1}^{\infty}\frac{(-1)^n\cdot(-3692685-132969815n+517888939n^2-2606628414n^3+2862472337n^4-3680766250n^5)}{8^n\binom{7n}{n}}=1381050\pi+166320\ln 2+35299449$$

$$\sum_{n=1}^{\infty}\frac{(-65979888+1181293644n-6191776770n^2+17657815350n^3-18752083422n^4+5314039086n^5)}{2^n\binom{7n}{2n}}=-20379280-740025\pi$$

$$\sum_{n=1}^{\infty}\frac{(-1)^n\cdot(-3492566143+43800371469n-167150412116n^2+227269717299n^3-57875111502n^4-32853312432n^5)}{72^n\binom{7n}{3n}}=-239940\pi\sqrt{3}-2060100\ln(4/3)-1998119$$

$$\sum_{n=1}^{\infty}\frac{81^n(-25318896980808+184961713447034n-1678370056088619n^2+603718430827535n^3+676738946332863n^4-5654304591976609n^5+2545194294351564n^6)}{8^n\binom{8n}{3n}}=-5927644800\pi\sqrt{3}+260097868800\ln 2+6747783476040$$

$$\sum_{n=1}^{\infty}\left(\frac{9}{8}\right)^n\frac{(-5692-6335n+5415n^2)}{\binom{4n}{n}}=576\ln 2-288\pi\sqrt{3}-324$$

$$\sum_{n=1}^{\infty}\left(\frac{9}{8}\right)^n\frac{(-7517-1145n-18050n^2)}{\binom{4n}{n}}=576\ln 2-1008\pi\sqrt{3}-7587$$

$$\sum_{n=1}^{\infty}\left(\frac{1}{9}\right)^n\frac{(291031-687311n+2689946n^2+1281974n^3)}{\binom{5n}{n}}=4980\pi\sqrt{3}-4860\ln 3+63344$$

$$\sum_{n=1}^{\infty}\frac{(-8)^n}{\binom{6n}{n}}(777201+584153n+9853281n^2+6110920n^3+6045975n^4)=177660\pi+1209000$$

$$\sum_{n=1}^{\infty}\frac{(-25157088+161814310n-1166240725n^2-137437765n^3-748223012n^4+2231209890n^5)}{2^n\binom{7n}{2n}}=645075\pi-37800\ln 2+20119790$$

$$\sum_{n=1}^{\infty}\frac{3^n(480-15215n+7175n^2)}{\binom{4n}{n}}=40\pi\sqrt{3}+1872$$

$$\sum_{n=1}^{\infty}\left(\frac{1}{9}\right)^n\frac{(108605+194518n-869012n^2+2703293n^3)}{\binom{5n}{n}}=3588\pi\sqrt{3}-2700\ln 3+54520$$

$$\sum_{n=1}^{\infty}\frac{(-8)^n}{\binom{6n}{n}}(65835-146217n+738791n^2-1087290n^3+2060111n^4)=-19215\pi-212760$$

$$\sum_{n=1}^{\infty}\left(-\frac{16}{3}\right)^n\frac{(-710+240n-2150n^2)}{\binom{4n}{n}}=15\ln 3+388$$

$$\sum_{n=1}^{\infty}\left(\frac{1}{2}\right)^n\frac{(1556186-9734011n+26638836n^2-17091891n^3)}{\binom{5n}{n}}=-9240\ln 2-202436$$

$$\sum_{n=1}^{\infty}\frac{8^n(520+6240n-430n^2)}{\binom{4n}{n}}=-45\pi-1164$$

$$\sum_{n=1}^{\infty}\frac{9^n(12724+130971n-2743n^2)}{\binom{4n}{n}}=360\pi\sqrt{3}-24516$$

$$\sum_{n=0}^{\infty}\left(\frac{1}{36}\right)^n\frac{(2n)!^2(3n)!}{(6n)!n!}(1173874n-202577)=720\ln 2-202176$$

$$\sum_{n=1}^{\infty}\frac{(-1)^n}{\binom{5n}{n}}(-15674+3133n-209370n^2-152145n^3)=992\pi\sqrt{3}+34424$$

$$\sum_{n=1}^{\infty}\left(-\frac{1}{3}\right)^n\frac{(2n)!^2(3n)!}{(6n)!n!}(22100n-4123)=-20\pi\sqrt{3}-89$$

$$\sum_{n=1}^{\infty}\frac{(-1)^n}{\binom{5n}{n}}(-6835-30529n+75936n^2-121716n^3)=8\pi\sqrt{3}+4960$$

$$\sum_{n=1}^{\infty}\left(\frac{1}{24}\right)^n\frac{(-141084+945231n-1544933n^2-561690n^3)}{\binom{5n}{2n}}=-304\pi\sqrt{3}+240\ln(4/3)-3916$$

$$\sum_{n=1}^{\infty}\left(\frac{1}{24}\right)^n\frac{(78943-331371n-224416n^2+2421508n^3)}{\binom{5n}{2n}}=416\pi\sqrt{3}-240\ln(4/3)+6057$$

$$\sum_{n=1}^{\infty}\frac{(-1)^n(397469292-1269354026n+6011341544n^2+3148052453n^3-18762408062n^4+20761455819n^5)}{\binom{7n}{2n}}=-87840\pi\sqrt{3}-140869620$$

$$\sum_{n=1}^{\infty}\frac{(-1)^n\cdot(822115871-8050128526n+10940262355n^2+59098803805n^3-160978080606n^4+95878992351n^5)}{72^n\binom{7n}{3n}}=101880\pi\sqrt{3}+929880\ln(4/3)+149797$$

$$\sum_{n=1}^{\infty}\left(\frac{1}{9}\right)^n\frac{(4n)!(3n)!n!}{(6n)!(2n)!}(-1482976n^2+1116904n-149503)=-210\pi\sqrt{3}-4829$$

$$\sum_{n=1}^{\infty}\left(\frac{-1}{162}\right)^n\frac{(4n)!(3n)!n!}{(6n)!(2n)!}(-129290000n^2+83261120n-10526525)=11340\ln 2+26981$$

$$\sum_{n=1}^{\infty}2^n\frac{(4n)!(3n)!n!}{(6n)!(2n)!}(-34800n^2+37160n-3850)=-105\pi-1802$$

$$\sum_{n=0}^{\infty}\frac{2^{5n}}{\binom{10n}{5n}}(-228+2770n-19600n^2+32750n^3-38750n^4)=-945\pi-3156$$

$$\sum_{n=0}^{\infty}\frac{2^{4n}}{\binom{8n}{4n}}(-16+424n-928n^2+1920n^3)=105\pi+304$$

$$\sum_{n=0}^{\infty}\frac{2^{3n}}{\binom{6n}{3n}}(-8+24n-126n^2)=-15\pi-52$$

$$\sum_{n=0}^{\infty}\frac{2^{2n}}{\binom{4n}{2n}}(12n)=3\pi+8$$

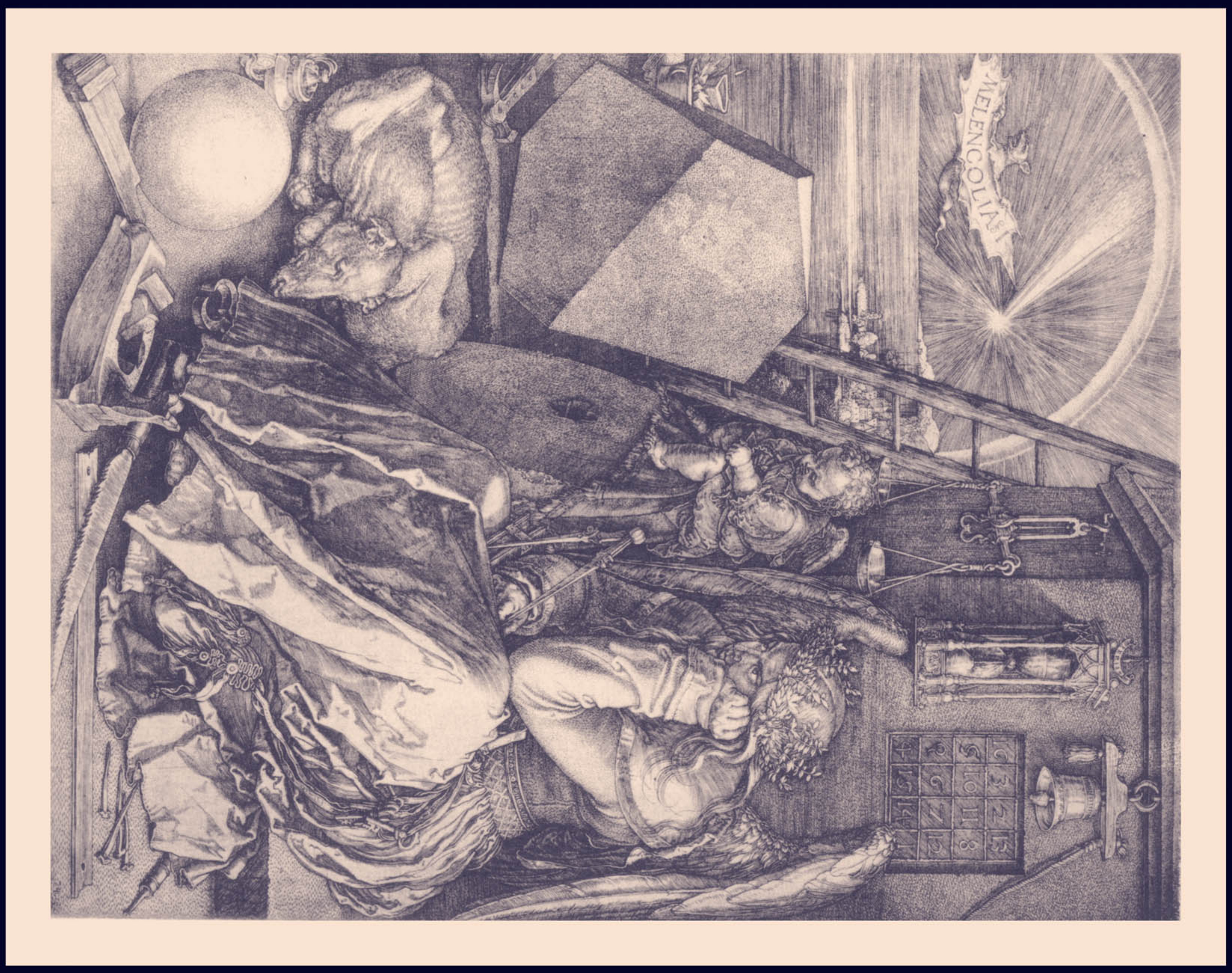
$$\sum_{n=0}^{\infty}\frac{2^{n+1}}{\binom{2n}{n}}=\pi+4$$

$$\zeta(3)=\frac{5}{2}\sum_{n=1}^{\infty}\frac{(-1)^{n+1}}{\binom{2n}{n}n^3}.$$

$$\frac{\zeta(3)}{2}-\frac{\ln^3(2)}{3}=-2\sum_{n=1}^{\infty}\frac{(-1)^n}{\binom{2n}{n}n^3 2^n}.$$

$$-3\sum_{n=1}^{\infty}\frac{1}{\binom{3n}{n}n^3 2^n}=-3G\pi+\frac{\pi^2\ln(2)}{8}-\frac{\ln^3(2)}{2}+\frac{99}{16}\zeta(3)$$

$$\sum_{n=1}^{\infty}\frac{\binom{2n}{n}}{4^n n^2}=-2\left(-\frac{\pi^2}{12}+\ln^2(2)\right)$$

$$-\frac{1}{2}\sum_{n=1}^{\infty}\frac{\binom{2n}{n}}{n^2}\left(\frac{3}{16}\right)^n+\frac{1}{6}\sum_{n=1}^{\infty}\frac{\binom{2n}{n}}{n^2}\left(-\frac{9}{64}\right)^n=-\frac{\pi^2}{18}+\ln^2(2)-\frac{\ln^2(3)}{6}$$