Catalan's constant G results

The following results are Polynomial Continued Fractions of the Catalan constant. For the results marked as "new and unproven", we have not found any formal proof yet.

Novelty	**Formula**	**Polynomials**	**Convergence** $[\frac{digits}{term}]$
known	$\frac{6}{-\pi \operatorname{acosh}(2)+8G} = 2 - \cfrac{2}{19-\cfrac{108}{56-\cfrac{750}{113-\cfrac{2744}{\ddots}}}}$	$a_n = 10n^2 + 7n + 2,\ b_n = -(2n-1)^4 - (2n-1)^3$	0.60046
new and unproven	$\frac{1}{2G} = 1 - \cfrac{2}{7-\cfrac{32}{19-\cfrac{162}{37-\cfrac{512}{\ddots}}}}$	$a_n = 3n^2 + 3n + 1,\ b_n = -2n^4$	0.298
new and unproven	$\frac{2}{2G-1} = 1 - \cfrac{4}{7-\cfrac{48}{19-\cfrac{216}{37-\cfrac{640}{\ddots}}}}$	$a_n = 3n^2 + 3n + 1,\ b_n = -2n^3(n+1)$	0.28903
new and unproven	$\frac{24}{18G-11} = 1 - \cfrac{6}{7-\cfrac{64}{19-\cfrac{270}{37-\cfrac{768}{\ddots}}}}$	$a_n = 3n^2 + 3n + 1,\ b_n = -2n^3(n+2)$	0.27984
new and unproven	$\frac{720}{450G-299} = 1 - \cfrac{8}{7-\cfrac{80}{19-\cfrac{324}{37-\cfrac{896}{\ddots}}}}$	$a_n = 3n^2 + 3n + 1,\ b_n = -2n^3(n+3)$	0.27042
new and unproven	$\frac{2}{2G-1} = 3 - \cfrac{6}{13-\cfrac{64}{29-\cfrac{270}{51-\cfrac{768}{\ddots}}}}$	$a_n = 3n^2 + 7n + 3,\ b_n = -2n^3(n+2)$	0.30387
new and unproven	$\frac{4}{2G+1} = 3 - \cfrac{12}{13-\cfrac{96}{29-\cfrac{360}{51-\cfrac{960}{\ddots}}}}$	$a_n = 3n^2 + 7n + 3,\ b_n = -2n^2(n+1)(n+2)$	0.29507
new and unproven	$\frac{16}{6G-1} = 3 - \cfrac{18}{13-\cfrac{128}{29-\cfrac{450}{51-\cfrac{1152}{\ddots}}}}$	$a_n = 3n^2 + 7n + 3,\ b_n = -2n^2(n+2)^2$	0.28608
new and unproven	$\frac{288}{90G-31} = 3 - \cfrac{24}{13-\cfrac{160}{29-\cfrac{540}{51-\cfrac{1344}{\ddots}}}}$	$a_n = 3n^2 + 7n + 3,\ b_n = -2n^2(n+2)(n+3)$	0.27687
new and unproven	$\frac{1}{2-2G} = 7 - \cfrac{16}{19-\cfrac{108}{37-\cfrac{384}{61-\cfrac{1000}{\ddots}}}}$	$a_n = 3n^2 + 9n + 7,\ b_n = -2n(n+1)^3$	0.30672
new and unproven	$\frac{24}{18G-11} = 5 - \cfrac{10}{19-\cfrac{96}{39-\cfrac{378}{65-\cfrac{1024}{\ddots}}}}$	$a_n = 3n^2 + 11n + 5,\ b_n = -2n^3(n+4)$	0.30966
new and unproven	$\frac{16}{6G-1} = 5 - \cfrac{20}{19-\cfrac{144}{39-\cfrac{504}{65-\cfrac{1280}{\ddots}}}}$	$a_n = 3n^2 + 11n + 5,\ b_n = -2n^2(n+1)(n+4)$	0.30103
new and unproven	$\frac{64}{18G+13} = 5 - \cfrac{30}{19-\cfrac{192}{39-\cfrac{630}{65-\cfrac{1536}{\ddots}}}}$	$a_n = 3n^2 + 11n + 5,\ b_n = -2n^2(n+2)(n+4)$	0.29221
new and unproven	$\frac{4}{6G-5} = 9 - \cfrac{18}{23-\cfrac{128}{43-\cfrac{450}{69-\cfrac{1152}{\ddots}}}}$	$a_n = 3n^2 + 11n + 9,\ b_n = -2n^2(n+2)^2$	0.30958
new and unproven	$\frac{8}{3-2G} = 9 - \cfrac{36}{23-\cfrac{192}{43-\cfrac{600}{69-\cfrac{1440}{\ddots}}}}$	$a_n = 3n^2 + 11n + 9,\ b_n = -2n(n+1)(n+2)^2$	0.30095
new and unproven	$\frac{32}{2G+5} = 9 - \cfrac{54}{23-\cfrac{256}{43-\cfrac{750}{69-\cfrac{1728}{\ddots}}}}$	$a_n = 3n^2 + 11n + 9,\ b_n = -2n(n+2)^3$	0.29213
new and unproven	$\frac{192}{18G+13} = 9 - \cfrac{72}{23-\cfrac{320}{43-\cfrac{900}{69-\cfrac{2016}{\ddots}}}}$	$a_n = 3n^2 + 11n + 9,\ b_n = -2n(n+2)^2(n+3)$	0.28311
new and unproven	$\frac{6}{17-18G} = 13 - \cfrac{32}{29-\cfrac{180}{51-\cfrac{576}{79-\cfrac{1400}{\ddots}}}}$	$a_n = 3n^2 + 13n + 13,\ b_n = -2n(n+1)^2(n+3)$	0.31239
new and unproven	$\frac{48}{90G-79} = 15 - \cfrac{30}{33-\cfrac{192}{57-\cfrac{630}{87-\cfrac{1536}{\ddots}}}}$	$a_n = 3n^2 + 15n + 15,\ b_n = -2n^2(n+2)(n+4)$	0.31522
new and unproven	$\frac{32}{19-18G} = 15 - \cfrac{60}{33-\cfrac{288}{57-\cfrac{840}{87-\cfrac{1920}{\ddots}}}}$	$a_n = 3n^2 + 15n + 15,\ b_n = -2n(n+1)(n+2)(n+4)$	0.30674
new and unproven	$\frac{128}{17-6G} = 15 - \cfrac{90}{33-\cfrac{384}{57-\cfrac{1050}{87-\cfrac{2304}{\ddots}}}}$	$a_n = 3n^2 + 15n + 15,\ b_n = -2n(n+2)^2(n+4)$	0.29808
new and unproven	$\frac{8}{54G-49} = 19 - \cfrac{54}{37-\cfrac{256}{61-\cfrac{750}{91-\cfrac{1728}{\ddots}}}}$	$a_n = 3n^2 + 15n + 19,\ b_n = -2n(n+2)^3$	0.31515
new and unproven	$\frac{12}{83-90G} = 23 - \cfrac{64}{43-\cfrac{300}{69-\cfrac{864}{101-\cfrac{1960}{\ddots}}}}$	$a_n = 3n^2 + 17n + 23,\ b_n = -2n(n+1)(n+3)^2$	0.31792