Target equation:

$$-ia_1u^{(1,0)}(x,t)+a_{10}u^{(10,0)}(x,t)-ia_{11}u^{(11,0)}(x,t)+a_{12}u^{(12,0)}(x,t)-ia_{13}u^{(13,0)}(x,t)+a_{14}u^{(14,0)}(x,t)-$$
$$ia_{15}u^{(15,0)}(x,t)+a_{16}u^{(16,0)}(x,t)-ia_{17}u^{(17,0)}(x,t)+a_{18}u^{(18,0)}(x,t)-ia_{19}u^{(19,0)}(x,t)+a_2u^{(2,0)}(x,t)+$$
$$a_{20}u^{(20,0)}(x,t)-ia_{21}u^{(21,0)}(x,t)+a_{22}u^{(22,0)}(x,t)-ia_{23}u^{(23,0)}(x,t)+a_{24}u^{(24,0)}(x,t)-ia_{25}u^{(25,0)}(x,t)+$$
$$a_{26}u^{(26,0)}(x,t)-ia_{27}u^{(27,0)}(x,t)+a_{28}u^{(28,0)}(x,t)-ia_{29}u^{(29,0)}(x,t)-ia_3u^{(3,0)}(x,t)+a_{30}u^{(30,0)}(x,t)-$$
$$ia_{31}u^{(31,0)}(x,t)+a_{32}u^{(32,0)}(x,t)-ia_{33}u^{(33,0)}(x,t)+a_{34}u^{(34,0)}(x,t)-ia_{35}u^{(35,0)}(x,t)+a_{36}u^{(36,0)}(x,t)-$$
$$ia_{37}u^{(37,0)}(x,t)+a_{38}u^{(38,0)}(x,t)-ia_{39}u^{(39,0)}(x,t)+a_4u^{(4,0)}(x,t)+a_{40}u^{(40,0)}(x,t)-ia_5u^{(5,0)}(x,t)+$$
$$a_6u^{(6,0)}(x,t)-ia_7u^{(7,0)}(x,t)+a_8u^{(8,0)}(x,t)-ia_9u^{(9,0)}(x,t)-bu(x,t)\left|u(x,t)\right|^2+iu^{(0,1)}(x,t)=0$$

Substitutions:

$$\mathrm{N}=20$$
$$u(x,t)\to y(z)e^{i(kx-\omega t)}$$
$$z\to x-\mathrm{C0}t$$
$$y(z)\to AR(z)^{20}$$
$$R'(z)^2=R(z)^2\left(1-\chi R(z)^2\right)$$

Imaginary part of equation after substitutions:

$$658008a_{40}y^{(5)}(z)k^{35}-575757a_{39}y^{(5)}(z)k^{34}-501942a_{38}y^{(5)}(z)k^{33}-18643560a_{40}y^{(7)}(z)k^{33}+435897a_{37}y^{(5)}(z)k^{32}$$
$$15380937a_{39}y^{(7)}(z)k^{32}+376992a_{36}y^{(5)}(z)k^{31}+12620256a_{38}y^{(7)}(z)k^{31}+273438880a_{40}y^{(9)}(z)k^{31}-$$
$$324632a_{35}y^{(5)}(z)k^{30}-10295472a_{37}y^{(7)}(z)k^{30}-211915132a_{39}y^{(9)}(z)k^{30}-278256a_{34}y^{(5)}(z)k^{29}-$$
$$8347680a_{36}y^{(7)}(z)k^{29}-163011640a_{38}y^{(9)}(z)k^{29}-2311801440a_{40}y^{(11)}(z)k^{29}+237336a_{33}y^{(5)}(z)k^{28}+$$
$$6724520a_{35}y^{(7)}(z)k^{28}+124403620a_{37}y^{(9)}(z)k^{28}+1676056044a_{39}y^{(11)}(z)k^{28}+201376a_{32}y^{(5)}(z)k^{27}+$$
$$5379616a_{34}y^{(7)}(z)k^{27}+94143280a_{36}y^{(9)}(z)k^{27}+1203322288a_{38}y^{(11)}(z)k^{27}+12033222880a_{40}y^{(13)}(z)k^{27}-$$
$$169911a_{31}y^{(5)}(z)k^{26}-4272048a_{33}y^{(7)}(z)k^{26}-70607460a_{35}y^{(9)}(z)k^{26}-854992152a_{37}y^{(11)}(z)k^{26}-$$
$$8122425444a_{39}y^{(13)}(z)k^{26}-142506a_{30}y^{(5)}(z)k^{25}-3365856a_{32}y^{(7)}(z)k^{25}-52451256a_{34}y^{(9)}(z)k^{25}-$$
$$600805296a_{36}y^{(11)}(z)k^{25}-5414950296a_{38}y^{(13)}(z)k^{25}-40225345056a_{40}y^{(15)}(z)k^{25}+118755a_{29}y^{(5)}(z)k^{24}+$$
$$2629575a_{31}y^{(7)}(z)k^{24}+38567100a_{33}y^{(9)}(z)k^{24}+417225900a_{35}y^{(11)}(z)k^{24}+3562467300a_{37}y^{(13)}(z)k^{24}+$$
$$25140840660a_{39}y^{(15)}(z)k^{24}+98280a_{28}y^{(5)}(z)k^{23}+2035800a_{30}y^{(7)}(z)k^{23}+28048800a_{32}y^{(9)}(z)k^{23}+$$
$$286097760a_{34}y^{(11)}(z)k^{23}+2310789600a_{36}y^{(13)}(z)k^{23}+15471286560a_{38}y^{(15)}(z)k^{23}+88732378800a_{40}y^{(17)}(z)k^{23}-$$
$$80730a_{27}y^{(5)}(z)k^{22}-1560780a_{29}y^{(7)}(z)k^{22}-20160075a_{31}y^{(9)}(z)k^{22}-193536720a_{33}y^{(11)}(z)k^{22}-$$
$$1476337800a_{35}y^{(13)}(z)k^{22}-9364199760a_{37}y^{(15)}(z)k^{22}-51021117810a_{39}y^{(17)}(z)k^{22}-65780a_{26}y^{(5)}(z)k^{21}-$$
$$1184040a_{28}y^{(7)}(z)k^{21}-14307150a_{30}y^{(9)}(z)k^{21}-129024480a_{32}y^{(11)}(z)k^{21}-927983760a_{34}y^{(13)}(z)k^{21}-$$
$$5567902560a_{36}y^{(15)}(z)k^{21}-28781143380a_{38}y^{(17)}(z)k^{21}-131282408400a_{40}y^{(19)}(z)k^{21}+53130a_{25}y^{(5)}(z)k^{20}+$$
$$888030a_{27}y^{(7)}(z)k^{20}+10015005a_{29}y^{(9)}(z)k^{20}+84672315a_{31}y^{(11)}(z)k^{20}+573166440a_{33}y^{(13)}(z)k^{20}+$$
$$3247943160a_{35}y^{(15)}(z)k^{20}+15905368710a_{37}y^{(17)}(z)k^{20}+68923264410a_{39}y^{(19)}(z)k^{20}+42504a_{24}y^{(5)}(z)k^{19}+$$
$$657800a_{26}y^{(7)}(z)k^{19}+6906900a_{28}y^{(9)}(z)k^{19}+54627300a_{30}y^{(11)}(z)k^{19}+347373600a_{32}y^{(13)}(z)k^{19}+$$
$$1855967520a_{34}y^{(15)}(z)k^{19}+8597496600a_{36}y^{(17)}(z)k^{19}+35345263800a_{38}y^{(19)}(z)k^{19}+131282408400a_{40}y^{(21)}(z)k$$
$$33649a_{23}y^{(5)}(z)k^{18}-480700a_{25}y^{(7)}(z)k^{18}-4686825a_{27}y^{(9)}(z)k^{18}-34597290a_{29}y^{(11)}(z)k^{18}-206253075a_{31}y^{(13)}($$
$$1037158320a_{33}y^{(15)}(z)k^{18}-4537567650a_{35}y^{(17)}(z)k^{18}-17672631900a_{37}y^{(19)}(z)k^{18}-62359143990a_{39}y^{(21)}(z)k^{1}$$
$$26334a_{22}y^{(5)}(z)k^{17}-346104a_{24}y^{(7)}(z)k^{17}-3124550a_{26}y^{(9)}(z)k^{17}-21474180a_{28}y^{(11)}(z)k^{17}-119759850a_{30}y^{(13)}($$
$$565722720a_{32}y^{(15)}(z)k^{17}-2333606220a_{34}y^{(17)}(z)k^{17}-8597496600a_{36}y^{(19)}(z)k^{17}-28781143380a_{38}y^{(21)}(z)k^{17}-$$
$$88732378800a_{40}y^{(23)}(z)k^{17}+20349a_{21}y^{(5)}(z)k^{16}+245157a_{23}y^{(7)}(z)k^{16}+2042975a_{25}y^{(9)}(z)k^{16}+$$

$$13037895a_{27}y^{(11)}(z)k^{16}+67863915a_{29}y^{(13)}(z)k^{16}+300540195a_{31}y^{(15)}(z)k^{16}+1166803110a_{33}y^{(17)}(z)k^{16}+$$
$$4059928950a_{35}y^{(19)}(z)k^{16}+12875774670a_{37}y^{(21)}(z)k^{16}+37711260990a_{39}y^{(23)}(z)k^{16}+15504a_{20}y^{(5)}(z)k^{15}+$$
$$170544a_{22}y^{(7)}(z)k^{15}+1307504a_{24}y^{(9)}(z)k^{15}+7726160a_{26}y^{(11)}(z)k^{15}+37442160a_{28}y^{(13)}(z)k^{15}+$$
$$155117520a_{30}y^{(15)}(z)k^{15}+565722720a_{32}y^{(17)}(z)k^{15}+1855967520a_{34}y^{(19)}(z)k^{15}+5567902560a_{36}y^{(21)}(z)k^{15}+$$
$$15471286560a_{38}y^{(23)}(z)k^{15}+40225345056a_{40}y^{(25)}(z)k^{15}-11628a_{19}y^{(5)}(z)k^{14}-116280a_{21}y^{(7)}(z)k^{14}-$$
$$817190a_{23}y^{(9)}(z)k^{14}-4457400a_{25}y^{(11)}(z)k^{14}-20058300a_{27}y^{(13)}(z)k^{14}-77558760a_{29}y^{(15)}(z)k^{14}-$$
$$265182525a_{31}y^{(17)}(z)k^{14}-818809200a_{33}y^{(19)}(z)k^{14}-2319959400a_{35}y^{(21)}(z)k^{14}-6107086800a_{37}y^{(23)}(z)k^{14}-$$
$$15084504396a_{39}y^{(25)}(z)k^{14}-8568a_{18}y^{(5)}(z)k^{13}-77520a_{20}y^{(7)}(z)k^{13}-497420a_{22}y^{(9)}(z)k^{13}-2496144a_{24}y^{(11)}(z)$$
$$10400600a_{26}y^{(13)}(z)k^{13}-37442160a_{28}y^{(15)}(z)k^{13}-119759850a_{30}y^{(17)}(z)k^{13}-347373600a_{32}y^{(19)}(z)k^{13}-$$
$$927983760a_{34}y^{(21)}(z)k^{13}-2310789600a_{36}y^{(23)}(z)k^{13}-5414950296a_{38}y^{(25)}(z)k^{13}-12033222880a_{40}y^{(27)}(z)k^{13}+$$
$$6188a_{17}y^{(5)}(z)k^{12}+50388a_{19}y^{(7)}(z)k^{12}+293930a_{21}y^{(9)}(z)k^{12}+1352078a_{23}y^{(11)}(z)k^{12}+5200300a_{25}y^{(13)}(z)k^{12}+$$
$$17383860a_{27}y^{(15)}(z)k^{12}+51895935a_{29}y^{(17)}(z)k^{12}+141120525a_{31}y^{(19)}(z)k^{12}+354817320a_{33}y^{(21)}(z)k^{12}+$$
$$834451800a_{35}y^{(23)}(z)k^{12}+1852482996a_{37}y^{(25)}(z)k^{12}+3910797436a_{39}y^{(27)}(z)k^{12}+4368a_{16}y^{(5)}(z)k^{11}+$$
$$31824a_{18}y^{(7)}(z)k^{11}+167960a_{20}y^{(9)}(z)k^{11}+705432a_{22}y^{(11)}(z)k^{11}+2496144a_{24}y^{(13)}(z)k^{11}+7726160a_{26}y^{(15)}(z)k^{11}$$
$$21474180a_{28}y^{(17)}(z)k^{11}+54627300a_{30}y^{(19)}(z)k^{11}+129024480a_{32}y^{(21)}(z)k^{11}+286097760a_{34}y^{(23)}(z)k^{11}+$$
$$600805296a_{36}y^{(25)}(z)k^{11}+1203322288a_{38}y^{(27)}(z)k^{11}+2311801440a_{40}y^{(29)}(z)k^{11}-3003a_{15}y^{(5)}(z)k^{10}-$$
$$19448a_{17}y^{(7)}(z)k^{10}-92378a_{19}y^{(9)}(z)k^{10}-352716a_{21}y^{(11)}(z)k^{10}-1144066a_{23}y^{(13)}(z)k^{10}-3268760a_{25}y^{(15)}(z)k^{10}$$
$$8436285a_{27}y^{(17)}(z)k^{10}-20030010a_{29}y^{(19)}(z)k^{10}-44352165a_{31}y^{(21)}(z)k^{10}-92561040a_{33}y^{(23)}(z)k^{10}-$$
$$183579396a_{35}y^{(25)}(z)k^{10}-348330136a_{37}y^{(27)}(z)k^{10}-635745396a_{39}y^{(29)}(z)k^{10}-2002a_{14}y^{(5)}(z)k^{9}-$$
$$11440a_{16}y^{(7)}(z)k^{9}-48620a_{18}y^{(9)}(z)k^{9}-167960a_{20}y^{(11)}(z)k^{9}-497420a_{22}y^{(13)}(z)k^{9}-1307504a_{24}y^{(15)}(z)k^{9}-$$
$$3124550a_{26}y^{(17)}(z)k^{9}-6906900a_{28}y^{(19)}(z)k^{9}-14307150a_{30}y^{(21)}(z)k^{9}-28048800a_{32}y^{(23)}(z)k^{9}-$$
$$52451256a_{34}y^{(25)}(z)k^{9}-94143280a_{36}y^{(27)}(z)k^{9}-163011640a_{38}y^{(29)}(z)k^{9}-273438880a_{40}y^{(31)}(z)k^{9}+$$
$$1287a_{13}y^{(5)}(z)k^{8}+6435a_{15}y^{(7)}(z)k^{8}+24310a_{17}y^{(9)}(z)k^{8}+75582a_{19}y^{(11)}(z)k^{8}+203490a_{21}y^{(13)}(z)k^{8}+$$
$$490314a_{23}y^{(15)}(z)k^{8}+1081575a_{25}y^{(17)}(z)k^{8}+2220075a_{27}y^{(19)}(z)k^{8}+4292145a_{29}y^{(21)}(z)k^{8}+7888725a_{31}y^{(23)}(z)$$
$$13884156a_{33}y^{(25)}(z)k^{8}+23535820a_{35}y^{(27)}(z)k^{8}+38608020a_{37}y^{(29)}(z)k^{8}+61523748a_{39}y^{(31)}(z)k^{8}+$$
$$792a_{12}y^{(5)}(z)k^{7}+3432a_{14}y^{(7)}(z)k^{7}+11440a_{16}y^{(9)}(z)k^{7}+31824a_{18}y^{(11)}(z)k^{7}+77520a_{20}y^{(13)}(z)k^{7}+$$
$$170544a_{22}y^{(15)}(z)k^{7}+346104a_{24}y^{(17)}(z)k^{7}+657800a_{26}y^{(19)}(z)k^{7}+1184040a_{28}y^{(21)}(z)k^{7}+2035800a_{30}y^{(23)}(z)k^{7}$$
$$3365856a_{32}y^{(25)}(z)k^{7}+5379616a_{34}y^{(27)}(z)k^{7}+8347680a_{36}y^{(29)}(z)k^{7}+12620256a_{38}y^{(31)}(z)k^{7}+$$
$$18643560a_{40}y^{(33)}(z)k^{7}-462a_{11}y^{(5)}(z)k^{6}-1716a_{13}y^{(7)}(z)k^{6}-5005a_{15}y^{(9)}(z)k^{6}-12376a_{17}y^{(11)}(z)k^{6}-$$
$$27132a_{19}y^{(13)}(z)k^{6}-54264a_{21}y^{(15)}(z)k^{6}-100947a_{23}y^{(17)}(z)k^{6}-177100a_{25}y^{(19)}(z)k^{6}-296010a_{27}y^{(21)}(z)k^{6}-$$
$$475020a_{29}y^{(23)}(z)k^{6}-736281a_{31}y^{(25)}(z)k^{6}-1107568a_{33}y^{(27)}(z)k^{6}-1623160a_{35}y^{(29)}(z)k^{6}-2324784a_{37}y^{(31)}(z)k$$
$$3262623a_{39}y^{(33)}(z)k^{6}-252a_{10}y^{(5)}(z)k^{5}-792a_{12}y^{(7)}(z)k^{5}-2002a_{14}y^{(9)}(z)k^{5}-4368a_{16}y^{(11)}(z)k^{5}-$$
$$8568a_{18}y^{(13)}(z)k^{5}-15504a_{20}y^{(15)}(z)k^{5}-26334a_{22}y^{(17)}(z)k^{5}-42504a_{24}y^{(19)}(z)k^{5}-65780a_{26}y^{(21)}(z)k^{5}-$$
$$98280a_{28}y^{(23)}(z)k^{5}-142506a_{30}y^{(25)}(z)k^{5}-201376a_{32}y^{(27)}(z)k^{5}-278256a_{34}y^{(29)}(z)k^{5}-376992a_{36}y^{(31)}(z)k^{5}-$$
$$501942a_{38}y^{(33)}(z)k^{5}-658008a_{40}y^{(35)}(z)k^{5}+126a_{9}y^{(5)}(z)k^{4}+330a_{11}y^{(7)}(z)k^{4}+715a_{13}y^{(9)}(z)k^{4}+$$
$$1365a_{15}y^{(11)}(z)k^{4}+2380a_{17}y^{(13)}(z)k^{4}+3876a_{19}y^{(15)}(z)k^{4}+5985a_{21}y^{(17)}(z)k^{4}+8855a_{23}y^{(19)}(z)k^{4}+$$
$$12650a_{25}y^{(21)}(z)k^{4}+17550a_{27}y^{(23)}(z)k^{4}+23751a_{29}y^{(25)}(z)k^{4}+31465a_{31}y^{(27)}(z)k^{4}+40920a_{33}y^{(29)}(z)k^{4}+$$
$$52360a_{35}y^{(31)}(z)k^{4}+66045a_{37}y^{(33)}(z)k^{4}+82251a_{39}y^{(35)}(z)k^{4}+56a_{8}y^{(5)}(z)k^{3}+120a_{10}y^{(7)}(z)k^{3}+$$
$$220a_{12}y^{(9)}(z)k^{3}+364a_{14}y^{(11)}(z)k^{3}+560a_{16}y^{(13)}(z)k^{3}+816a_{18}y^{(15)}(z)k^{3}+1140a_{20}y^{(17)}(z)k^{3}+$$
$$1540a_{22}y^{(19)}(z)k^{3}+2024a_{24}y^{(21)}(z)k^{3}+2600a_{26}y^{(23)}(z)k^{3}+3276a_{28}y^{(25)}(z)k^{3}+4060a_{30}y^{(27)}(z)k^{3}+$$

$4960a_{32}y^{(29)}(z)k^3+5984a_{34}y^{(31)}(z)k^3+7140a_{36}y^{(33)}(z)k^3+8436a_{38}y^{(35)}(z)k^3+9880a_{40}y^{(37)}(z)k^3-$
$21a_7y^{(5)}(z)k^2-36a_9y^{(7)}(z)k^2-55a_{11}y^{(9)}(z)k^2-78a_{13}y^{(11)}(z)k^2-105a_{15}y^{(13)}(z)k^2-136a_{17}y^{(15)}(z)k^2-$
$171a_{19}y^{(17)}(z)k^2 - 210a_{21}y^{(19)}(z)k^2 - 253a_{23}y^{(21)}(z)k^2 - 300a_{25}y^{(23)}(z)k^2 - 351a_{27}y^{(25)}(z)k^2 -$
$406a_{29}y^{(27)}(z)k^2 - 465a_{31}y^{(29)}(z)k^2 - 528a_{33}y^{(31)}(z)k^2 - 595a_{35}y^{(33)}(z)k^2 - 666a_{37}y^{(35)}(z)k^2 -$
$741a_{39}y^{(37)}(z)k^2 - 6a_6y^{(5)}(z)k - 8a_8y^{(7)}(z)k - 10a_{10}y^{(9)}(z)k - 12a_{12}y^{(11)}(z)k - 14a_{14}y^{(13)}(z)k -$
$16a_{16}y^{(15)}(z)k-18a_{18}y^{(17)}(z)k-20a_{20}y^{(19)}(z)k-22a_{22}y^{(21)}(z)k-24a_{24}y^{(23)}(z)k-26a_{26}y^{(25)}(z)k-$
$28a_{28}y^{(27)}(z)k-30a_{30}y^{(29)}(z)k-32a_{32}y^{(31)}(z)k-34a_{34}y^{(33)}(z)k-36a_{36}y^{(35)}(z)k-38a_{38}y^{(37)}(z)k-$
$40a_{40}y^{(39)}(z)k+(a_1 - \mathrm{C0} + k\,(k\,(k\,(4a_4 + k\,(5a_5 + k\,(k\,(k\,(8a_8 + k\,(9a_9 + k\,(k\,(k\,(12a_{12} + k\,(13a_{13} + k\,(k\,(k($
$(a_3 + k\,(k\,(k\,(20a_6 + k\,(35a_7 + k\,(k\,(k\,(120a_{10} + k\,(165a_{11} + k\,(k\,(k\,(364a_{14} + k\,(455a_{15} + k\,(k\,(k\,(816a_{18} + k$
$a_5y^{(5)}(z)+a_7y^{(7)}(z)+a_9y^{(9)}(z)+a_{11}y^{(11)}(z)+a_{13}y^{(13)}(z)+a_{15}y^{(15)}(z)+a_{17}y^{(17)}(z)+a_{19}y^{(19)}(z)+$
$a_{21}y^{(21)}(z) + a_{23}y^{(23)}(z) + a_{25}y^{(25)}(z) + a_{27}y^{(27)}(z) + a_{29}y^{(29)}(z) + a_{31}y^{(31)}(z) + a_{33}y^{(33)}(z) +$
$a_{35}y^{(35)}(z) + a_{37}y^{(37)}(z) + a_{39}y^{(39)}(z) = 0$

Real part of equation after substitutions:

$91390a_{40}y^{(4)}(z)k^{36}-82251a_{39}y^{(4)}(z)k^{35}-73815a_{38}y^{(4)}(z)k^{34}-3838380a_{40}y^{(6)}(z)k^{34}+66045a_{37}y^{(4)}(z)k^{33}+$
$3262623a_{39}y^{(6)}(z)k^{33}+58905a_{36}y^{(4)}(z)k^{32}+2760681a_{38}y^{(6)}(z)k^{32}+76904685a_{40}y^{(8)}(z)k^{32}-52360a_{35}y^{(4)}(z)k^{31}$
$2324784a_{37}y^{(6)}(z)k^{31}-61523748a_{39}y^{(8)}(z)k^{31}-46376a_{34}y^{(4)}(z)k^{30}-1947792a_{36}y^{(6)}(z)k^{30}-48903492a_{38}y^{(8)}(z$
$847660528a_{40}y^{(10)}(z)k^{30} + 40920a_{33}y^{(4)}(z)k^{29} + 1623160a_{35}y^{(6)}(z)k^{29} + 38608020a_{37}y^{(8)}(z)k^{29} +$
$635745396a_{39}y^{(10)}(z)k^{29} + 35960a_{32}y^{(4)}(z)k^{28} + 1344904a_{34}y^{(6)}(z)k^{28} + 30260340a_{36}y^{(8)}(z)k^{28} +$
$472733756a_{38}y^{(10)}(z)k^{28}+5586853480a_{40}y^{(12)}(z)k^{28}-31465a_{31}y^{(4)}(z)k^{27}-1107568a_{33}y^{(6)}(z)k^{27}-$
$23535820a_{35}y^{(8)}(z)k^{27}-348330136a_{37}y^{(10)}(z)k^{27}-3910797436a_{39}y^{(12)}(z)k^{27}-27405a_{30}y^{(4)}(z)k^{26}-$
$906192a_{32}y^{(6)}(z)k^{26}-18156204a_{34}y^{(8)}(z)k^{26}-254186856a_{36}y^{(10)}(z)k^{26}-2707475148a_{38}y^{(12)}(z)k^{26}-$
$23206929840a_{40}y^{(14)}(z)k^{26} + 23751a_{29}y^{(4)}(z)k^{25} + 736281a_{31}y^{(6)}(z)k^{25} + 13884156a_{33}y^{(8)}(z)k^{25} +$
$183579396a_{35}y^{(10)}(z)k^{25}+1852482996a_{37}y^{(12)}(z)k^{25}+15084504396a_{39}y^{(14)}(z)k^{25}+20475a_{28}y^{(4)}(z)k^{24}+$
$593775a_{30}y^{(6)}(z)k^{24}+10518300a_{32}y^{(8)}(z)k^{24}+131128140a_{34}y^{(10)}(z)k^{24}+1251677700a_{36}y^{(12)}(z)k^{24}+$
$9669554100a_{38}y^{(14)}(z)k^{24}+62852101650a_{40}y^{(16)}(z)k^{24}-17550a_{27}y^{(4)}(z)k^{23}-475020a_{29}y^{(6)}(z)k^{23}-$
$7888725a_{31}y^{(8)}(z)k^{23}-92561040a_{33}y^{(10)}(z)k^{23}-834451800a_{35}y^{(12)}(z)k^{23}-6107086800a_{37}y^{(14)}(z)k^{23}-$
$37711260990a_{39}y^{(16)}(z)k^{23} - 14950a_{26}y^{(4)}(z)k^{22} - 376740a_{28}y^{(6)}(z)k^{22} - 5852925a_{30}y^{(8)}(z)k^{22} -$
$64512240a_{32}y^{(10)}(z)k^{22}-548354040a_{34}y^{(12)}(z)k^{22}-3796297200a_{36}y^{(14)}(z)k^{22}-22239974430a_{38}y^{(16)}(z)k^{22}-$
$113380261800a_{40}y^{(18)}(z)k^{22} + 12650a_{25}y^{(4)}(z)k^{21} + 296010a_{27}y^{(6)}(z)k^{21} + 4292145a_{29}y^{(8)}(z)k^{21} +$
$44352165a_{31}y^{(10)}(z)k^{21}+354817320a_{33}y^{(12)}(z)k^{21}+2319959400a_{35}y^{(14)}(z)k^{21}+12875774670a_{37}y^{(16)}(z)k^{21}+$
$62359143990a_{39}y^{(18)}(z)k^{21} + 10626a_{24}y^{(4)}(z)k^{20} + 230230a_{26}y^{(6)}(z)k^{20} + 3108105a_{28}y^{(8)}(z)k^{20} +$
$30045015a_{30}y^{(10)}(z)k^{20}+225792840a_{32}y^{(12)}(z)k^{20}+1391975640a_{34}y^{(14)}(z)k^{20}+7307872110a_{36}y^{(16)}(z)k^{20}+$
$33578000610a_{38}y^{(18)}(z)k^{20}+137846528820a_{40}y^{(20)}(z)k^{20}-8855a_{23}y^{(4)}(z)k^{19}-177100a_{25}y^{(6)}(z)k^{19}-$
$2220075a_{27}y^{(8)}(z)k^{19}-20030010a_{29}y^{(10)}(z)k^{19}-141120525a_{31}y^{(12)}(z)k^{19}-818809200a_{33}y^{(14)}(z)k^{19}-$
$4059928950a_{35}y^{(16)}(z)k^{19}-17672631900a_{37}y^{(18)}(z)k^{19}-68923264410a_{39}y^{(20)}(z)k^{19}-7315a_{22}y^{(4)}(z)k^{18}-$
$134596a_{24}y^{(6)}(z)k^{18} - 1562275a_{26}y^{(8)}(z)k^{18} - 13123110a_{28}y^{(10)}(z)k^{18} - 86493225a_{30}y^{(12)}(z)k^{18} -$
$471435600a_{32}y^{(14)}(z)k^{18}-2203961430a_{34}y^{(16)}(z)k^{18}-9075135300a_{36}y^{(18)}(z)k^{18}-33578000610a_{38}y^{(20)}(z)k^{18}-$
$113380261800a_{40}y^{(22)}(z)k^{18} + 5985a_{21}y^{(4)}(z)k^{17} + 100947a_{23}y^{(6)}(z)k^{17} + 1081575a_{25}y^{(8)}(z)k^{17} +$
$8436285a_{27}y^{(10)}(z)k^{17}+51895935a_{29}y^{(12)}(z)k^{17}+265182525a_{31}y^{(14)}(z)k^{17}+1166803110a_{33}y^{(16)}(z)k^{17}+$
$4537567650a_{35}y^{(18)}(z)k^{17}+15905368710a_{37}y^{(20)}(z)k^{17}+51021117810a_{39}y^{(22)}(z)k^{17}+4845a_{20}y^{(4)}(z)k^{16}+$

$$74613a_{22}y^{(6)}(z)k^{16}+735471a_{24}y^{(8)}(z)k^{16}+5311735a_{26}y^{(10)}(z)k^{16}+30421755a_{28}y^{(12)}(z)k^{16}+145422675a_{30}y^{(14)}$$
$$601080390a_{32}y^{(16)}(z)k^{16}+2203961430a_{34}y^{(18)}(z)k^{16}+7307872110a_{36}y^{(20)}(z)k^{16}+22239974430a_{38}y^{(22)}(z)k^{16}+$$
$$62852101650a_{40}y^{(24)}(z)k^{16}-3876a_{19}y^{(4)}(z)k^{15}-54264a_{21}y^{(6)}(z)k^{15}-490314a_{23}y^{(8)}(z)k^{15}-3268760a_{25}y^{(10)}(z)$$
$$17383860a_{27}y^{(12)}(z)k^{15}-77558760a_{29}y^{(14)}(z)k^{15}-300540195a_{31}y^{(16)}(z)k^{15}-1037158320a_{33}y^{(18)}(z)k^{15}-$$
$$3247943160a_{35}y^{(20)}(z)k^{15}-9364199760a_{37}y^{(22)}(z)k^{15}-25140840660a_{39}y^{(24)}(z)k^{15}-3060a_{18}y^{(4)}(z)k^{14}-$$
$$38760a_{20}y^{(6)}(z)k^{14}-319770a_{22}y^{(8)}(z)k^{14}-1961256a_{24}y^{(10)}(z)k^{14}-9657700a_{26}y^{(12)}(z)k^{14}-40116600a_{28}y^{(14)}(z$$
$$145422675a_{30}y^{(16)}(z)k^{14}-471435600a_{32}y^{(18)}(z)k^{14}-1391975640a_{34}y^{(20)}(z)k^{14}-3796297200a_{36}y^{(22)}(z)k^{14}-$$
$$9669554100a_{38}y^{(24)}(z)k^{14}-23206929840a_{40}y^{(26)}(z)k^{14}+2380a_{17}y^{(4)}(z)k^{13}+27132a_{19}y^{(6)}(z)k^{13}+$$
$$203490a_{21}y^{(8)}(z)k^{13}+1144066a_{23}y^{(10)}(z)k^{13}+5200300a_{25}y^{(12)}(z)k^{13}+20058300a_{27}y^{(14)}(z)k^{13}+$$
$$67863915a_{29}y^{(16)}(z)k^{13}+206253075a_{31}y^{(18)}(z)k^{13}+573166440a_{33}y^{(20)}(z)k^{13}+1476337800a_{35}y^{(22)}(z)k^{13}+$$
$$3562467300a_{37}y^{(24)}(z)k^{13}+8122425444a_{39}y^{(26)}(z)k^{13}+1820a_{16}y^{(4)}(z)k^{12}+18564a_{18}y^{(6)}(z)k^{12}+$$
$$125970a_{20}y^{(8)}(z)k^{12}+646646a_{22}y^{(10)}(z)k^{12}+2704156a_{24}y^{(12)}(z)k^{12}+9657700a_{26}y^{(14)}(z)k^{12}+$$
$$30421755a_{28}y^{(16)}(z)k^{12}+86493225a_{30}y^{(18)}(z)k^{12}+225792840a_{32}y^{(20)}(z)k^{12}+548354040a_{34}y^{(22)}(z)k^{12}+$$
$$1251677700a_{36}y^{(24)}(z)k^{12}+2707475148a_{38}y^{(26)}(z)k^{12}+5586853480a_{40}y^{(28)}(z)k^{12}-1365a_{15}y^{(4)}(z)k^{11}-$$
$$12376a_{17}y^{(6)}(z)k^{11}-75582a_{19}y^{(8)}(z)k^{11}-352716a_{21}y^{(10)}(z)k^{11}-1352078a_{23}y^{(12)}(z)k^{11}-4457400a_{25}y^{(14)}(z)k^{11}$$
$$13037895a_{27}y^{(16)}(z)k^{11}-34597290a_{29}y^{(18)}(z)k^{11}-84672315a_{31}y^{(20)}(z)k^{11}-193536720a_{33}y^{(22)}(z)k^{11}-$$
$$417225900a_{35}y^{(24)}(z)k^{11}-854992152a_{37}y^{(26)}(z)k^{11}-1676056044a_{39}y^{(28)}(z)k^{11}-1001a_{14}y^{(4)}(z)k^{10}-$$
$$8008a_{16}y^{(6)}(z)k^{10}-43758a_{18}y^{(8)}(z)k^{10}-184756a_{20}y^{(10)}(z)k^{10}-646646a_{22}y^{(12)}(z)k^{10}-1961256a_{24}y^{(14)}(z)k^{10}-$$
$$5311735a_{26}y^{(16)}(z)k^{10}-13123110a_{28}y^{(18)}(z)k^{10}-30045015a_{30}y^{(20)}(z)k^{10}-64512240a_{32}y^{(22)}(z)k^{10}-$$
$$131128140a_{34}y^{(24)}(z)k^{10}-254186856a_{36}y^{(26)}(z)k^{10}-472733756a_{38}y^{(28)}(z)k^{10}-847660528a_{40}y^{(30)}(z)k^{10}+$$
$$715a_{13}y^{(4)}(z)k^{9}+5005a_{15}y^{(6)}(z)k^{9}+24310a_{17}y^{(8)}(z)k^{9}+92378a_{19}y^{(10)}(z)k^{9}+293930a_{21}y^{(12)}(z)k^{9}+$$
$$817190a_{23}y^{(14)}(z)k^{9}+2042975a_{25}y^{(16)}(z)k^{9}+4686825a_{27}y^{(18)}(z)k^{9}+10015005a_{29}y^{(20)}(z)k^{9}+$$
$$20160075a_{31}y^{(22)}(z)k^{9}+38567100a_{33}y^{(24)}(z)k^{9}+70607460a_{35}y^{(26)}(z)k^{9}+124403620a_{37}y^{(28)}(z)k^{9}+$$
$$211915132a_{39}y^{(30)}(z)k^{9}+495a_{12}y^{(4)}(z)k^{8}+3003a_{14}y^{(6)}(z)k^{8}+12870a_{16}y^{(8)}(z)k^{8}+43758a_{18}y^{(10)}(z)k^{8}+$$
$$125970a_{20}y^{(12)}(z)k^{8}+319770a_{22}y^{(14)}(z)k^{8}+735471a_{24}y^{(16)}(z)k^{8}+1562275a_{26}y^{(18)}(z)k^{8}+3108105a_{28}y^{(20)}(z)k^{8}$$
$$5852925a_{30}y^{(22)}(z)k^{8}+10518300a_{32}y^{(24)}(z)k^{8}+18156204a_{34}y^{(26)}(z)k^{8}+30260340a_{36}y^{(28)}(z)k^{8}+$$
$$48903492a_{38}y^{(30)}(z)k^{8}+76904685a_{40}y^{(32)}(z)k^{8}-330a_{11}y^{(4)}(z)k^{7}-1716a_{13}y^{(6)}(z)k^{7}-6435a_{15}y^{(8)}(z)k^{7}-$$
$$19448a_{17}y^{(10)}(z)k^{7}-50388a_{19}y^{(12)}(z)k^{7}-116280a_{21}y^{(14)}(z)k^{7}-245157a_{23}y^{(16)}(z)k^{7}-480700a_{25}y^{(18)}(z)k^{7}-$$
$$888030a_{27}y^{(20)}(z)k^{7}-1560780a_{29}y^{(22)}(z)k^{7}-2629575a_{31}y^{(24)}(z)k^{7}-4272048a_{33}y^{(26)}(z)k^{7}-6724520a_{35}y^{(28)}(z)$$
$$10295472a_{37}y^{(30)}(z)k^{7}-15380937a_{39}y^{(32)}(z)k^{7}-210a_{10}y^{(4)}(z)k^{6}-924a_{12}y^{(6)}(z)k^{6}-3003a_{14}y^{(8)}(z)k^{6}-$$
$$8008a_{16}y^{(10)}(z)k^{6}-18564a_{18}y^{(12)}(z)k^{6}-38760a_{20}y^{(14)}(z)k^{6}-74613a_{22}y^{(16)}(z)k^{6}-134596a_{24}y^{(18)}(z)k^{6}-$$
$$230230a_{26}y^{(20)}(z)k^{6}-376740a_{28}y^{(22)}(z)k^{6}-593775a_{30}y^{(24)}(z)k^{6}-906192a_{32}y^{(26)}(z)k^{6}-1344904a_{34}y^{(28)}(z)k^{6}-$$
$$1947792a_{36}y^{(30)}(z)k^{6}-2760681a_{38}y^{(32)}(z)k^{6}-3838380a_{40}y^{(34)}(z)k^{6}+126a_{9}y^{(4)}(z)k^{5}+462a_{11}y^{(6)}(z)k^{5}+$$
$$1287a_{13}y^{(8)}(z)k^{5}+3003a_{15}y^{(10)}(z)k^{5}+6188a_{17}y^{(12)}(z)k^{5}+11628a_{19}y^{(14)}(z)k^{5}+20349a_{21}y^{(16)}(z)k^{5}+$$
$$33649a_{23}y^{(18)}(z)k^{5}+53130a_{25}y^{(20)}(z)k^{5}+80730a_{27}y^{(22)}(z)k^{5}+118755a_{29}y^{(24)}(z)k^{5}+169911a_{31}y^{(26)}(z)k^{5}+$$
$$237336a_{33}y^{(28)}(z)k^{5}+324632a_{35}y^{(30)}(z)k^{5}+435897a_{37}y^{(32)}(z)k^{5}+575757a_{39}y^{(34)}(z)k^{5}+70a_{8}y^{(4)}(z)k^{4}+$$
$$210a_{10}y^{(6)}(z)k^{4}+495a_{12}y^{(8)}(z)k^{4}+1001a_{14}y^{(10)}(z)k^{4}+1820a_{16}y^{(12)}(z)k^{4}+3060a_{18}y^{(14)}(z)k^{4}+$$
$$4845a_{20}y^{(16)}(z)k^{4}+7315a_{22}y^{(18)}(z)k^{4}+10626a_{24}y^{(20)}(z)k^{4}+14950a_{26}y^{(22)}(z)k^{4}+20475a_{28}y^{(24)}(z)k^{4}+$$
$$27405a_{30}y^{(26)}(z)k^{4}+35960a_{32}y^{(28)}(z)k^{4}+46376a_{34}y^{(30)}(z)k^{4}+58905a_{36}y^{(32)}(z)k^{4}+73815a_{38}y^{(34)}(z)k^{4}+$$
$$91390a_{40}y^{(36)}(z)k^{4}-35a_{7}y^{(4)}(z)k^{3}-84a_{9}y^{(6)}(z)k^{3}-165a_{11}y^{(8)}(z)k^{3}-286a_{13}y^{(10)}(z)k^{3}-455a_{15}y^{(12)}(z)k^{3}-$$

$680a_{17}y^{(14)}(z)k^3-969a_{19}y^{(16)}(z)k^3-1330a_{21}y^{(18)}(z)k^3-1771a_{23}y^{(20)}(z)k^3-2300a_{25}y^{(22)}(z)k^3-$
$2925a_{27}y^{(24)}(z)k^3-3654a_{29}y^{(26)}(z)k^3-4495a_{31}y^{(28)}(z)k^3-5456a_{33}y^{(30)}(z)k^3-6545a_{35}y^{(32)}(z)k^3-$
$7770a_{37}y^{(34)}(z)k^3-9139a_{39}y^{(36)}(z)k^3-15a_6y^{(4)}(z)k^2-28a_8y^{(6)}(z)k^2-45a_{10}y^{(8)}(z)k^2-66a_{12}y^{(10)}(z)k^2-$
$91a_{14}y^{(12)}(z)k^2-120a_{16}y^{(14)}(z)k^2-153a_{18}y^{(16)}(z)k^2-190a_{20}y^{(18)}(z)k^2-231a_{22}y^{(20)}(z)k^2-$
$276a_{24}y^{(22)}(z)k^2-325a_{26}y^{(24)}(z)k^2-378a_{28}y^{(26)}(z)k^2-435a_{30}y^{(28)}(z)k^2-496a_{32}y^{(30)}(z)k^2-$
$561a_{34}y^{(32)}(z)k^2-630a_{36}y^{(34)}(z)k^2-703a_{38}y^{(36)}(z)k^2-780a_{40}y^{(38)}(z)k^2+5a_5y^{(4)}(z)k+7a_7y^{(6)}(z)k+$
$9a_9y^{(8)}(z)k+11a_{11}y^{(10)}(z)k+13a_{13}y^{(12)}(z)k+15a_{15}y^{(14)}(z)k+17a_{17}y^{(16)}(z)k+19a_{19}y^{(18)}(z)k+$
$21a_{21}y^{(20)}(z)k+23a_{23}y^{(22)}(z)k+25a_{25}y^{(24)}(z)k+27a_{27}y^{(26)}(z)k+29a_{29}y^{(28)}(z)k+31a_{31}y^{(30)}(z)k+$
$33a_{33}y^{(32)}(z)k+35a_{35}y^{(34)}(z)k+37a_{37}y^{(36)}(z)k+39a_{39}y^{(38)}(z)k-by(z)^3+(a_{40}k^{40}-a_{39}k^{39}-a_{38}k^{38}+a_{37}k^{37}+$
$(a_2+k\,(3a_3+k\,(k\,(15a_6+k\,(21a_7+k\,(k\,(45a_{10}+k\,(55a_{11}+k\,(k\,(91a_{14}+k\,(105a_{15}+k\,(k\,(153a$
$a_4y^{(4)}(z)+a_6y^{(6)}(z)+a_8y^{(8)}(z)+a_{10}y^{(10)}(z)+a_{12}y^{(12)}(z)+a_{14}y^{(14)}(z)+a_{16}y^{(16)}(z)+a_{18}y^{(18)}(z)+$
$a_{20}y^{(20)}(z)+a_{22}y^{(22)}(z)+a_{24}y^{(24)}(z)+a_{26}y^{(26)}(z)+a_{28}y^{(28)}(z)+a_{30}y^{(30)}(z)+a_{32}y^{(32)}(z)+$
$a_{34}y^{(34)}(z)+a_{36}y^{(36)}(z)+a_{38}y^{(38)}(z)+a_{40}y^{(40)}(z)=0$

Constraints on coefficients from imaginary part of equation:

$a_{39}\to 40a_{40}k$

$a_{37}\to 38a_{38}k+19760a_{40}k^3$

$a_{35}\to 36a_{36}k+16872a_{38}k^3+10528128a_{40}k^5$

$a_{33}\to 34a_{34}k+14280a_{36}k^3+8031072a_{38}k^5+5071048320a_{40}k^7$

$a_{31}\to 32a_{32}k+11968a_{34}k^3+6031872a_{36}k^5+3432709632a_{38}k^7+2170010951680a_{40}k^9$

$a_{29}\to 30a_{30}k+9920a_{32}k^3+4452096a_{34}k^5+2270568960a_{36}k^7+1293660375040a_{38}k^9+817896855060480a_{40}k^{11}$

$a_{27}\to 28a_{28}k+8120a_{30}k^3+3222016a_{32}k^5+1463255552a_{34}k^7+747121070080a_{36}k^9+425725798916096a_{38}k^{11}+$
$269162209884897280a_{40}k^{13}$

$a_{25}\to 26a_{26}k+6552a_{28}k^3+2280096a_{30}k^5+915512832a_{32}k^7+416253167616a_{34}k^9+212560107282432a_{36}k^{11}+$
$121122994448203776a_{38}k^{13}+76579294778083049472a_{40}k^{15}$

$a_{23}\to 24a_{24}k+5200a_{26}k^3+1572480a_{28}k^5+553737600a_{30}k^7+222595276800a_{32}k^9+101219098705920a_{34}k^{11}+$
$51688333334937600a_{36}k^{13}+29453574914647326720a_{38}k^{15}+18621851109938351308800a_{40}k^{17}$

$a_{21}\to 22a_{22}k+4048a_{24}k^3+1052480a_{26}k^5+322058880a_{28}k^7+113541542400a_{30}k^9+45647828828160a_{32}k^{11}+$
$20757378307522560a_{34}k^{13}+10599935211103518720a_{36}k^{15}+6040164526685131898880a_{38}k^{17}+$
$3818858895283490704588800a_{40}k^{19}$

$a_{19}\to 20a_{20}k+3080a_{22}k^3+680064a_{24}k^5+178921600a_{26}k^7+54813158400a_{28}k^9+19326701721600a_{30}k^{11}+$
$7770141612441600a_{32}k^{13}+3533311737034506240a_{34}k^{15}+1804316572693993881600a_{36}k^{17}+1028154317960936$
$650044589602042466952806400a_{40}k^{21}$

$a_{17}\to 18a_{18}k+2280a_{20}k^3+421344a_{22}k^5+94140288a_{24}k^7+24796428800a_{26}k^9+7597393090560a_{28}k^{11}+$
$2678818983321600a_{30}k^{13}+1076998764764528640a_{32}k^{15}+489743069731226910720a_{34}k^{17}+250091590855363$
$142509775412755463908884480a_{38}k^{21}+901009769400942316933349376 00a_{40}k^{23}$

$a_{15}\to 16a_{16}k+1632a_{18}k^3+248064a_{20}k^5+46387968a_{22}k^7+10376351744a_{24}k^9+2733453598720a_{26}k^{11}+$
$837515820072960a_{28}k^{13}+295306112919306240a_{30}k^{15}+118725592662115614720a_{32}k^{17}+539880259624277272$
$2756945868582467011608576 0a_{36}k^{21}+1570991392801643014140198912 0a_{38}k^{23}+9932501742389384653359 59$

$a_{13}\to 14a_{14}k+1120a_{16}k^3+137088a_{18}k^5+21085440a_{20}k^7+3947525120a_{22}k^9+883115778048a_{24}k^{11}+$
$232643283353600a_{26}k^{13}+71280785877073920a_{28}k^{15}+25133441995004313600a_{30}k^{17}+1010471074163085803 5$

$459490978097077835268096 0a_{34}k^{21}+2346430956531614743737139200a_{36}k^{23}+133706754224472485718302 23$
$845353179777223156360543584911360a_{40}k^{27}$
$a_{11} \to 12a_{12}k+728a_{14}k^3+69888a_{16}k^5+8656128a_{18}k^7+1332930560a_{20}k^9+249576198144a_{22}k^{11}+$
$55834388004864a_{24}k^{13}+14708733593681920a_{26}k^{15}+4506686150828359680a_{28}k^{17}+158904725372420751360 0$
$63886446152534886187008 0a_{32}k^{21}+29051049938010468255793152 0a_{34}k^{23}+14835173299443604389797403 03$
$845353179777223156360543584911360a_{38}k^{27} + 53446963297003458735739412246691840a_{40}k^{29}$
$a_9 \to 10a_{10}k + 440a_{12}k^3 + 32032a_{14}k^5 + 3111680a_{16}k^7 + 385848320a_{18}k^9 + 59422904320a_{20}k^{11} +$
$11126417899520a_{22}k^{13}+2489170300469248a_{24}k^{15}+65573475739566080 0a_{26}k^{17}+20091402058581934080 0a_{28}$
$70841825370754410086400a_{30}k^{21}+28481421507853400250777600a_{32}k^{23}+12951341769355527641886621696a$
$66137162002485453200327023001 60a_{36}k^{27}+37686961299169105518790611199590 40a_{38}k^{29}+2382736216670 0$
$a_7 \to 240a_{10}k^3+12672a_{12}k^5+933504a_{14}k^7+90787840a_{16}k^9+11259076608a_{18}k^{11}+1733987205120a_{20}k^{13}+$
$324674387017728a_{22}k^{15}+72635234665365504a_{24}k^{17}+19134668627220889600a_{26}k^{19}+586277175482105462 78$
$20671999481506500182016 00a_{30}k^{23}+83110214562709268290181529 6a_{32}k^{25}+37792664001420258971615441 7$
$19299155146089442370931180699648 0a_{36}k^{29}+10997244076938546056101545949475635 2a_{38}k^{31}+$
$69529436288775916290530686560223887360a_{40}k^{33} + 8a_8k$
$a_5 \to 4032a_{10}k^5 + 215424a_{12}k^7 + 15887872a_{14}k^9 + 1545363456a_{16}k^{11} + 191651217408a_{18}k^{13} +$
$29515853365248a_{20}k^{15}+5526593941929984a_{22}k^{17}+1236393972835811328a_{24}k^{19}+325709541934503034880a_2$
$99795859565893449154560a_{28}k^{23}+35187792455985778913181696a_{30}k^{25}+14146986524595818866380111872a$
$64330517153631474569770602332 16a_{34}k^{29}+32850942477341318233020265282928 64a_{36}k^{31}+1871946361620 8$
$11835272035042324243974523037072448552 96a_{40}k^{35} + 6a_6k + 112a_8k^3$
$a_3 \to 32640a_{10}k^7+1745920a_{12}k^9+128780288a_{14}k^{11}+12526223360a_{16}k^{13}+1553465966592a_{18}k^{15}+$
$239246490992640a_{20}k^{17}+44796883073761280a_{22}k^{19}+10021832059523170304a_{24}k^{21}+26401021049178161152$
$80891476910312135432601 6a_{28}k^{25}+28522150251201247714476032 0a_{30}k^{27}+11467115357153560529370873 85$
$52144353138637013068286135369728a_{34}k^{31} + 26627971004564581137636218728611840a_{36}k^{33} +$
$15173425685951697748685285944964677632a_{38}k^{35}+4a_4k+95933101705563840303084691145672674508 80a_4$
$40a_6k^3 + 896a_8k^5$
$\text{C0} \to a_1-79360a_{10}k^9-4245504a_{12}k^{11}-313155584a_{14}k^{13}-30460116992a_{16}k^{15}-3777576173568a_{18}k^{17}-$
$2a_2k - 581777702256640a_{20}k^{19} - 108932957168730112a_{22}k^{21} - 24370173276164456448a_{24}k^{23} -$
$64199584849454075740 16a_{26}k^{25}-19670448449104308768604 16a_{28}k^{27}-69357552563428793524420608 0a_{30}k^2$
$27884680822800541747746596454 4a_{32}k^{31}-12679986192649800541731532727910 4a_{34}k^{33}-64751460964231 99$
$36897346809832246270417188902181797888a_{38}k^{37}-8a_4k^3-23328132996692401757727665665019771617280$
$96a_6k^5 - 2176a_8k^7$
Constraints on coefficients from real part of equation:
$b \to \frac{1140063332428478117199455252283090043450189182538874880000000000a_{40}\chi^{20}}{A^2}$
$a_{38} \to -780a_{40}k^2 - 33080a_{40}$
$a_{36} \to 91390a_{40}k^4 + 23255240a_{40}k^2 + 511553872a_{40}$
$a_{34} \to -3838380a_{40}k^6 - 2441800200a_{40}k^4 - 322278939360a_{40}k^2 - 4914984375040a_{40}$
$a_{32} \to 76904685a_{40}k^8 + 91323327480a_{40}k^6 + 30133080830160a_{40}k^4 + 2757306234397440a_{40}k^2 +$
$32890700554899968a_{40}$
$a_{30} \to -847660528a_{40}k^{10}-1617727515360a_{40}k^8-996400539450624a_{40}k^6-227937315376855040a_{40}k^4-$

$$16313787475230384128a_{40}k^2 - 162880018162989076480a_{40}$$

$$a_{28} \to 5586853480a_{40}k^{12}+15638032648480a_{40}k^{10}+15479794095036480a_{40}k^8+6610182145928796160a_{40}k^6+$$

$$1182749591954202849280a_{40}k^4+7085280790090024826880 0a_{40}k^2+619056335924838086221824a_{40}$$

$$a_{26} \to -23206929840a_{40}k^{14}-89563277895840a_{40}k^{12}-130030270398306432a_{40}k^{10}-89237458970038748160a_{4}$$

$$29805289717245911801856a_{40}k^6-44637268977567156409344 00a_{40}k^4-23400329497958879659184947 2a_{40}k^2-$$

$$184820499638114392426414080 0a_{40}$$

$$a_{24} \to 62852101650a_{40}k^{16}+319868849628000a_{40}k^{14}+64030057393105440 0a_{40}k^{12}+64449275922805762560 0a_{4}$$

$$34595425564660433341440 0a_{40}k^8+96714082784728838886912000a_{40}k^6+12675178478061059815391846400a_{4}$$

$$60066662382387177538584576000 0a_{40}k^2 + 43999342948936231933199282995 20a_{40}$$

$$a_{22} \to -113380261800a_{40}k^{18}-735698354144400a_{40}k^{16}-1942010531922758400a_{40}k^{14}-269515153859005916$$

$$21218527679658399116083 20a_{40}k^{10}-95332453030661284045670400 0a_{40}k^8-23322328399632350060320997$$

$$27630664695898101667748904960000a_{40}k^4-12143818653906400013563002106675 20a_{40}k^2-84306445593348$$

$$a_{20} \to 137846528820a_{40}k^{20}+1110760260178800a_{40}k^{18}+373837027395130992 0a_{40}k^{16}+68415385210363040250$$

$$74264846878804396906291 20a_{40}k^{12}+48937325889072792476777472 00a_{40}k^{10}+19240920929696688799764822$$

$$42551223631683076568333313638400 0a_{40}k^6+46753701817539640052217558110699520a_{40}k^4+194747889320$$

$$13065877805017849439682453647727263744a_{40}$$

$$a_{18} \to -113380261800a_{40}k^{22}-1110760260178800a_{40}k^{20}-464242060163888160 0a_{40}k^{18}-10832435991640814$$

$$15505847150519599354060800a_{40}k^{14}-14088018058975500864526848000a_{40}k^{12}-8123944392538601937678 48$$

$$28874044607213516242797605683200 00a_{40}k^8-59221355635550210732808906940219392 0a_{40}k^6-$$

$$61670164951534121705619990386900992000a_{40}k^4-24825167829533913935396661930681801113 60a_{40}k^2-$$

$$16398815450021536593084202275635011256320a_{40}$$

$$a_{16} \to 62852101650a_{40}k^{24}+735698354144400a_{40}k^{22}+373837027395130992 0a_{40}k^{20}+10832435991640814707 2$$

$$19769955116912489176427520a_{40}k^{16}+23686447945310457497501184000a_{40}k^{14}+18832780182703122673709 2$$

$$98171751664525955225511859322880 00a_{40}k^{10}+32360240757997079436142009863762739 20a_{40}k^8+$$

$$62903568250564804139732390194639011840 0a_{40}k^6+63304177965311480535261487923238592839680a_{40}k^4+$$

$$25090187638532950987418829481721567222169 60a_{40}k^2+16629932894406828100869007916730572811010 04$$

$$a_{14} \to -23206929840a_{40}k^{26}-319868849628000a_{40}k^{24}-1942010531922758400a_{40}k^{22}-6841538521036304025 6$$

$$15505847150519599354060800a_{40}k^{18}-23686447945310457497501184000a_{40}k^{16}-24834435405762359569726 4$$

$$17849409393550173677365792604160000a_{40}k^{12}-86293975354658878496378692970033971 20a_{40}k^{10}-$$

$$26958672107384916059885310083416719360 00a_{40}k^8-50643342372249184428209190338590874271744 0a_{40}k^{6}$$

$$50180375277065901974837658963443134444339200a_{40}k^4-19955919473288193721042809500076687373212 0$$

$$13544719831929257381713194615194014398241832960a_{40}$$

$$a_{12} \to 5586853480a_{40}k^{28}+89563277895840a_{40}k^{26}+640300573931054400a_{40}k^{24}+2695151538590059161600a_{4}$$

$$74264846878804396906291 20a_{40}k^{20}+14088018058975500864526848000a_{40}k^{18}+18832780182703122673709 20$$

$$17849409393550173677365792604160000a_{40}k^{14}+11898108723142360519955244030716805120a_{40}k^{12}+$$

$$54516425817156163587768071502020476928 00a_{40}k^{10}+16459086270980984939167986860042034138316 80a_{4}$$

$$30442761001419980531401513104488834896232448 0a_{40}k^6+30266477867820427143581594408449642516038$$

$$12325695047055624217359007099826553102400067993 60a_{40}k^2+87690598641183398287507108563052327 79$$

$$a_{10} \to -847660528a_{40}k^{30}-15638032648480a_{40}k^{28}-130030270398306432a_{40}k^{26}-64449275922805762560 0a_{4}$$

$$21218527679658399116083 20a_{40}k^{22}-48937325889072792476777472 00a_{40}k^{20}-81239443925386019376784807$$

$$98171751664525955225511859322880000a_{40}k^{16}-8629397535465887849637869297003397120a_{40}k^{14}-\blacksquare$$
$$5451642581715616358776807150202047692800a_{40}k^{12}-241399931974387779107797140613949834028646 4a_{40}$$
$$7175793664620423982401785231772368225540505 60a_{40}k^{8}-133172502618409879431759015397178427070 56$$
$$1355826455176118663909490780980920841264007479296 0a_{40}k^{4}-57875795103181042869754691651614536 3$$
$$4440880588525944615781107293039205045546601540485120a_{40}$$
$$a_8 \to 76904685a_{40}k^{32}+1617727515360a_{40}k^{30}+15479794095036480a_{40}k^{28}+8923745897003874816 0a_{40}k^{26}+\blacksquare$$
$$3459542556466043334144 00a_{40}k^{24}+9533245303066128404567040 00a_{40}k^{22}+1924092092969668879976482283$$
$$2887404460721351624279760568320000a_{40}k^{18}+3236024075799707943614200986376273920a_{40}k^{16}+\blacksquare$$
$$2695867210738491605988531008341671936000a_{40}k^{14}+16459086270980984939167986860042034138316 80a_{40}$$
$$7175793664620423982401785231772368225540505 60a_{40}k^{10}+2140272363510158776581841318883224720776 9$$
$$4067479365528355991728472342942762523792022 4378880a_{40}k^{6}+43406846327385782152316018738710902 2$$
$$1998396264836675077101498281867642270495970693218304 00a_{40}k^{2}+17170437615705847111038730452576$$
$$a_6 \to -3838380a_{40}k^{34}-91323327480a_{40}k^{32}-996400539450624a_{40}k^{30}-661018214592879616 0a_{40}k^{28}-\blacksquare$$
$$2980528971724591180185 6a_{40}k^{26}-96714082784728838886912000a_{40}k^{24}-2332232839963235006032099737 60$$
$$4255122363168307656833331363840 00a_{40}k^{20}-5922135563555021073280890694021939 20a_{40}k^{18}-\blacksquare$$
$$6290356825056480413973239019463901184 00a_{40}k^{16}-5064334237224918442820919033859087427174 40a_{40}k^{1}$$
$$3044276100141998053140151310448883489623244 80a_{40}k^{12}-133172502618409879431759015397178427070 56$$
$$4067479365528355991728472342942762523792022 4378880a_{40}k^{8}-81026113144453460017656568312260350 8$$
$$9325849235904483693140325315382330595647863235018752 00a_{40}k^{4}-48077225323976371910908445267214$$
$$4882311936298459677663344161529020188701018686891229184 00a_{40}$$
$$a_4 \to 91390a_{40}k^{36}+2441800200a_{40}k^{34}+30133080830160a_{40}k^{32}+227937315376855040a_{40}k^{30}+$$
$$1182749591954202849280a_{40}k^{28}+4463726897756715640934400a_{40}k^{26}+1267517847806105981539184640 0a_{40}$$
$$2763066469589810166774890496 0000a_{40}k^{22}+467537018175396400522175581106995 20a_{40}k^{20}+$$
$$6167016495153412170561999038690099 2000a_{40}k^{18}+6330417796531148053526148792323859283968 0a_{40}k^{16}+$$
$$5018037527706590197483765896344313444433920 0a_{40}k^{14}+3026647786782042714358159440844964251603 82$$
$$1355826455176118663909490780980920841264007479296 0a_{40}k^{10}+4340684632738578215231601873871090 22$$
$$9325849235904483693140325315382330595647863235018752 00a_{40}k^{6}+12019306330994092977727111316803$$
$$7323467904447689516495016242293530283051528030336843776000a_{40}k^{2}+95994437523179049949529972 85$$
$$a_2 \to -780a_{40}k^{38}-23255240a_{40}k^{36}-322278939360a_{40}k^{34}-2757306234397440a_{40}k^{32}-1631378747523038412 8$$
$$7085280790090024826880 0a_{40}k^{28}-2340032949795887965918494 72a_{40}k^{26}-6006666238238717753858457600 0$$
$$1214381865390640001356300210667520a_{40}k^{22}-19474788932063406854406312753758208 00a_{40}k^{20}-\blacksquare$$
$$2482516782953391393539666193068180111360a_{40}k^{18}-25090187638532950987418829481721567222169 60a_{40}$$
$$1995591947328819372104280950007668737321205760a_{40}k^{14}-12325695047055624217359007099826553102 40$$
$$5787579510318104286975469165161453634592293854904 32a_{40}k^{10}-19983962648366750771014982818676422$$
$$4807722532397637191090844526721479411589355263658609868 8a_{40}k^{6}-732346790444768951649501624229$$
$$5759666251390742996971798371511994628573325405857408614400 00a_{40}k^{2}-11630702309334716381133665$$
$$\omega \to -a_1k-39a_{40}k^{40}-1223960a_{40}k^{38}-17904385520a_{40}k^{36}-162194484376320a_{40}k^{34}-101961171720189900 8$$
$$4723520526726683217920a_{40}k^{30}-16714521069970628327989248a_{40}k^{28}-46205124909528598106603520000a_{4}$$
$$1011984887825533334463583508889 60a_{40}k^{24}-17704353574603097140369375230689280 0a_{40}k^{22}-\blacksquare$$
$$2482516782953391393539666193068180111 36a_{40}k^{20}-27877986265036612208243143868579519135744 0a_{40}k^{1}$$

$$249448993416102421513035118750958592165150720a_{40}k^{16}-176081357815080345962271529997522187177$$
$$964596585053017381162578194193575605765382309150 72a_{40}k^{12}-399679252967335015420299656373528454$$
$$120193063309940929777271113168036985289733881591465246 72a_{40}k^{8}-244115596814922983883167208076$$
$$287983312569537149848589918575599731428666270292870430720000a_{40}k^{4}-116307023093347163811336 65$$
$$652756794737866583725244818048447395904775038162698240000000000a_{40}$$