```
******************************9-CAGE-12******************************

Edges of 9-CAGE-12:

( 49   50)  ( 15   16)  ( 11   12)  ( 12   20)  ( 45   46)  ( 40   41)
( 21   22)  (  1    2)  ( 22   31)  (  8    9)  ( 26   34)  ( 30   31)
( 13   14)  ( 25   54)  ( 11   52)  ( 47   48)  (  5    6)  (  6    7)
( 39   40)  ( 54   55)  ( 27   48)  ( 39   55)  ( 13   37)  (  9   10)
( 30   56)  ( 55   56)  (  7    8)  ( 32   33)  ( 23   24)  ( 43   44)
( 19   20)  ( 57   58)  ( 10   28)  ( 14   15)  ( 26   27)  ( 31   32)
( 51   52)  ( 27   28)  ( 29   30)  ( 35   36)  (  6   18)  ( 40   49)
( 18   19)  ( 45   53)  ( 17   57)  ( 46   47)  ( 10   11)  (  2   41)
( 20   21)  ( 32   51)  (  5   33)  ( 21   47)  ( 15   24)  ( 33   34)
( 29   43)  (  1    9)  (  2    3)  ( 44   45)  ( 53   54)  ( 34   35)
( 42   43)  (  4    5)  ( 58    1)  ( 36   37)  (  3    4)  ( 56   57)
( 22   23)  ( 24   25)  ( 25   26)  ( 28   29)  ( 37   38)  ( 38   39)
(  8   23)  ( 48   49)  ( 35   58)  ( 36   44)  ( 19   42)  ( 50   51)
( 12   13)  ( 16   50)  (  3   14)  (  7   38)  ( 52   53)  (  4   46)
( 16   17)  ( 41   42)  ( 17   18)
```

Chromatic polynomial relative the tree basis:

$$
\begin{aligned}
P(9-CAGE-12,x) = {} & +1x*(x-1)^{57} \\
& -30x*(x-1)^{56} \\
& +465x*(x-1)^{55} \\
& -4960x*(x-1)^{54} \\
& +40920x*(x-1)^{53} \\
& -278256x*(x-1)^{52} \\
& +1623160x*(x-1)^{51} \\
& -8347680x*(x-1)^{50} \\
& +38607925x*(x-1)^{49} \\
& -163008690x*(x-1)^{48} \\
& +635698157x*(x-1)^{47} \\
& -2311281635x*(x-1)^{46} \\
& +7894236186x*(x-1)^{45} \\
& -25487800879x*(x-1)^{44} \\
& +78193391098x*(x-1)^{43} \\
& -228930857385x*(x-1)^{42} \\
& +641968672207x*(x-1)^{41} \\
& -1729518312433x*(x-1)^{40} \\
& +4487991198303x*(x-1)^{39} \\
& -11241535894402x*(x-1)^{38} \\
& +27228223632658x*(x-1)^{37} \\
& -63865643851917x*(x-1)^{36} \\
& +145238080383848x*(x-1)^{35} \\
& -320522633871824x*(x-1)^{34} \\
& +686910846475130x*(x-1)^{33} \\
& -1430244904342747x*(x-1)^{32} \\
& +2894050559427442x*(x-1)^{31} \\
& -5691433840768474x*(x-1)^{30} \\
& +10877057007848754x*(x-1)^{29} \\
& -20195356497199048x*(x-1)^{28} \\
& +36411714311937736x*(x-1)^{27} \\
& -63709140809819891x*(x-1)^{26} \\
& +108087594106917528x*(x-1)^{25} \\
& -177633147997928667x*(x-1)^{24} \\
& +282436426651798167x*(x-1)^{23} \\
& -433858846081474477x*(x-1)^{22} \\
& +642821034567224041x*(x-1)^{21} \\
& -916893075210009592x*(x-1)^{20} \\
& +1256275700775483141x*(x-1)^{19} \\
& -1649304939197591247x*(x-1)^{18} \\
& +2068806301095836261x*(x-1)^{17} \\
& -2471212138458205467x*(x-1)^{16} \\
& +2800416466704402864x*(x-1)^{15} \\
& -2997432271512393824x*(x-1)^{14} \\
& +3014868720630146391x*(x-1)^{13} \\
& -2832517248117537799x*(x-1)^{12} \\
& +2468159916302356501x*(x-1)^{11} \\
& -1977736047601966792x*(x-1)^{10} \\
& +1442295644719641246x*(x-1)^{9} \\
& -945043578367728519x*(x-1)^{8} \\
& +547374809983858615x*(x-1)^{7} \\
& -274347276252727994x*(x-1)^{6} \\
& +115583254883988076x*(x-1)^{5} \\
& -39253771843277984x*(x-1)^{4} \\
& +10061569608073015x*(x-1)^{3} \\
& -1727399937345237x*(x-1)^{2} \\
& +148677080928014x*(x-1)^{1}
\end{aligned}
$$

Chromatic polynomial relative the standard basis:

$$
\begin{aligned}
P(9-Cage-12,x) = {} & \\
& -29616767065727655700x \\
& +417846957704750090526x^2 \\
& -2967250460823838053182x^3 \\
& +14154499278874134075030x^4 \\
& -5105838422820968238 4012x^5 \\
& +14861695384973792798 5057x^6 \\
& -3636659281987324549 16527x^7 \\
& +7694842402334193732 42297x^8 \\
& -1436315400313201126427676x^9 \\
& +2405036883520316657346527x^{10} \\
& -3651283127145178872478773x^{11} \\
& +5076042756925831918498890x^{12} \\
& -6511267051698987397216033x^{13} \\
& +7754374419183598585147826x^{14} \\
& -8617023647518275498306284x^{15} \\
& +8971991647092289277535115x^{16} \\
& -8782306202737630330655658x^{17} \\
& +8104266053766249425131999x^{18} \\
& -7066014536858390416997330x^{19} \\
& +5831342235355383045277223x^{20} \\
& -4561500347270099027796392x^{21} \\
& +3385797552464033119304703x^{22} \\
& -2386560703566259771328467x^{23} \\
& +1598367407253142019154220x^{24} \\
& -1017443789433211916113857x^{25} \\
& +615635561600052660738481x^{26} \\
& -3540683285663232101578 85x^{27} \\
& +1935078025744708630562 76x^{28} \\
& -1004587852757578742835 08x^{29} \\
& +4951319732676053985929 0x^{30} \\
& -2315265735189932022222 8x^{31} \\
& +1026287960015992972906 0x^{32} \\
& -4308299578446475842854x^{33} \\
& +1710909182269525809126x^{34} \\
& -641921512018190163417x^{35} \\
& +227221425417514133007x^{36} \\
& -75758339087427754566x^{37} \\
& +23748820791527601203x^{38} \\
& -6985637161580160616x^{39} \\
& +1923699251101104825x^{40} \\
& -494683764252459329x^{41} \\
& +118447936585250493x^{42} \\
& -26322074723711761x^{43} \\
& +5408679045828129x^{44} \\
& -1023266728419679x^{45} \\
& +177366479125143x^{46} \\
& -28005249498664x^{47} \\
& +4000750744667x^{48} \\
& -512916793065x^{49} \\
& +58433559475x^{50} \\
& -5843355957x^{51} \\
& +504981379x^{52} \\
& -36949857x^{53} \\
& +2225895x^{54} \\
& -105995x^{55} \\
& +3741x^{56} \\
& -87x^{57} \\
& +1x^{58}
\end{aligned}
$$

Roots of the chromatic polynomial of 9-CAGE-12:

$x- > 0.$
$x- > 1.$
$x- > 2.$
$x- > 2.68328$
$x- > -0.666842 - 1.15105I$
$x- > -0.666842 + 1.15105I$
$x- > -0.41303 - 1.39084I$
$x- > -0.41303 + 1.39084I$
$x- > -0.179361 - 1.53681I$
$x- > -0.179361 + 1.53681I$
$x- > 0.038169 - 1.646I$
$x- > 0.038169 + 1.646I$
$x- > 0.245716 - 1.73586I$
$x- > 0.245716 + 1.73586I$
$x- > 0.447398 - 1.81325I$
$x- > 0.447398 + 1.81325I$
$x- > 0.6443 - 1.87268I$
$x- > 0.6443 + 1.87268I$
$x- > 0.826789 - 1.89283I$
$x- > 0.826789 + 1.89283I$
$x- > 0.99907 - 1.88391I$
$x- > 0.99907 + 1.88391I$
$x- > 1.16018 - 1.8505I$
$x- > 1.16018 + 1.8505I$
$x- > 1.32096 - 1.80443I$
$x- > 1.32096 + 1.80443I$
$x- > 1.4785 - 1.74949I$
$x- > 1.4785 + 1.74949I$
$x- > 1.63167 - 1.68642I$
$x- > 1.63167 + 1.68642I$
$x- > 1.7835 - 1.61434I$
$x- > 1.7835 + 1.61434I$
$x- > 1.9271 - 1.53243I$
$x- > 1.9271 + 1.53243I$
$x- > 2.05664 - 1.44818I$
$x- > 2.05664 + 1.44818I$
$x- > 2.16746 - 1.36597I$
$x- > 2.16746 + 1.36597I$
$x- > 2.24979 - 1.27346I$
$x- > 2.24979 + 1.27346I$
$x- > 2.32314 - 1.15745I$
$x- > 2.32314 + 1.15745I$
$x- > 2.39624 - 1.03128I$
$x- > 2.39624 + 1.03128I$
$x- > 2.46585 - 0.898961I$
$x- > 2.46585 + 0.898961I$
$x- > 2.5284 - 0.762204I$
$x- > 2.5284 + 0.762204I$
$x- > 2.58308 - 0.626842I$
$x- > 2.58308 + 0.626842I$
$x- > 2.62815 - 0.495992I$
$x- > 2.62815 + 0.495992I$
$x- > 2.65866 - 0.36936I$
$x- > 2.65866 + 0.36936I$
$x- > 2.67513 - 0.245001I$
$x- > 2.67513 + 0.245001I$
$x- > 2.6817 - 0.121976I$
$x- > 2.6817 + 0.121976I$