**********9-CAGE-9**********

Edges of 9-CAGE-9:

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

Chromatic polynomial relative the tree basis:

$$
\begin{aligned}
P(9-CAGE-9,x) = {} & \\
& +1x*(x-1)^{57} \\
& -30x*(x-1)^{56} \\
& +465x*(x-1)^{55} \\
& -4960x*(x-1)^{54} \\
& +40920x*(x-1)^{53} \\
& -278256x*(x-1)^{52} \\
& +1623160x*(x-1)^{51} \\
& -8347680x*(x-1)^{50} \\
& +38607924x*(x-1)^{49} \\
& -163008656x*(x-1)^{48} \\
& +635697583x*(x-1)^{47} \\
& -2311275154x*(x-1)^{46} \\
& +7894180797x*(x-1)^{45} \\
& -25487417275x*(x-1)^{44} \\
& +78191143393x*(x-1)^{43} \\
& -228919380580x*(x-1)^{42} \\
& +641916504005x*(x-1)^{41} \\
& -1729303795638x*(x-1)^{40} \\
& +4487183282252x*(x-1)^{39} \\
& -11238721656359x*(x-1)^{38} \\
& +27219085830315x*(x-1)^{37} \\
& -63837810576553x*(x-1)^{36} \\
& +145158136525049x*(x-1)^{35} \\
& -320305180934661x*(x-1)^{34} \\
& +686348703911593x*(x-1)^{33} \\
& -1428859720757447x*(x-1)^{32} \\
& +2890789146769420x*(x-1)^{31} \\
& -5684081761713017x*(x-1)^{30} \\
& +10861163399501228x*(x-1)^{29} \\
& -20162365584853392x*(x-1)^{28} \\
& +36345897393561763x*(x-1)^{27} \\
& -63582861922096875x*(x-1)^{26} \\
& +107854505047404336x*(x-1)^{25} \\
& -177219216914358150x*(x-1)^{24} \\
& +281729404996319707x*(x-1)^{23} \\
& -432697982566540630x*(x-1)^{22} \\
& +640990517326781199x*(x-1)^{21} \\
& -914124489079124205x*(x-1)^{20} \\
& +1252265946628460768x*(x-1)^{19} \\
& -1643755351585708136x*(x-1)^{18} \\
& +2061484760688334105x*(x-1)^{17} \\
& -2462032076415879715x*(x-1)^{16} \\
& +2789515806830913093x*(x-1)^{15} \\
& -2985225229055791851x*(x-1)^{14} \\
& +3002040098812532992x*(x-1)^{13} \\
& -2819938696760150263x*(x-1)^{12} \\
& +2456732548730919515x*(x-1)^{11} \\
& -1968197239077474603x*(x-1)^{10} \\
& +1435053999329459803x*(x-1)^{9} \\
& -940106654123559938x*(x-1)^{8} \\
& +544400910608515221x*(x-1)^{7} \\
& -272797635256268674x*(x-1)^{6} \\
& +114904698691712044x*(x-1)^{5} \\
& -39014328673751404x*(x-1)^{4} \\
& +9997822420690506x*(x-1)^{3} \\
& -1716037943903993x*(x-1)^{2} \\
& +147662509384938x*(x-1)^{1}
\end{aligned}
$$

Chromatic polynomial relative the standard basis:

$$
\begin{aligned}
P(9-Cage-9,x) = {} & \\
& -294961609486972161 90x \\
& +4162287535758912824 67x^{2} \\
& -2956350728007376948644x^{3} \\
& +14105320514616006185151x^{4} \\
& -5089110851598890323687 1x^{5} \\
& +1481594060591966297830 92x^{6} \\
& -3626177734976674114450 62x^{7} \\
& +7674167727757125527255 03x^{8} \\
& -1433359869103186653370137x^{9} \\
& +2399503232519031911263905x^{10} \\
& -3643574138436025532064881x^{11} \\
& +5066271203581443550136235x^{12} \\
& -6499918008157850241542155x^{13} \\
& +7742229058366444836232475x^{14} \\
& -8604993914679666003417176x^{15} \\
& +8960924219480576378393908x^{16} \\
& -8772821607358786845405090x^{17} \\
& +8096677662302116386369524x^{18} \\
& -7060336472427007647050627x^{19} \\
& +5827363479157488457769759x^{20} \\
& -4558886933543973097817345x^{21} \\
& +3384187427008398935715969x^{22} \\
& -2385629912036982606601761x^{23} \\
& +1597862489591833844310394x^{24} \\
& -1017186815359258375537774x^{25} \\
& +6155129083446345944403 24x^{26} \\
& -3540134620442420983768 65x^{27} \\
& +1934848205275741085306 31x^{28} \\
& -1004497813599046378812 33x^{29} \\
& +4950990249387527265471 0x^{30} \\
& -2315153307253133918119 5x^{31} \\
& +1026252256979208135359 0x^{32} \\
& -4308194301045043487314x^{33} \\
& +1710880433901233328673x^{34} \\
& -641914264237555720696x^{35} \\
& +227219744434775160240x^{36} \\
& -75757981906517106089x^{37} \\
& +23748751596168832406x^{38} \\
& -6985625009387146363x^{39} \\
& +1923697329416353206x^{40} \\
& -494683492841558092x^{41} \\
& +118447902686653345x^{42} \\
& -26322071025509384x^{43} \\
& +5408678698901496x^{44}
\end{aligned}
\qquad
\begin{aligned}
& -1023266701005721x^{45} \\
& +177366477351194x^{46} \\
& -28005249408429x^{47} \\
& +4000750741285x^{48} \\
& -512916792982x^{49} \\
& +58433559474x^{50} \\
& -5843355957x^{51} \\
& +504981379x^{52} \\
& -36949857x^{53} \\
& +2225895x^{54} \\
& -105995x^{55} \\
& +3741x^{56} \\
& -87x^{57} \\
& +1x^{58}
\end{aligned}
$$

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

$x- > 0.$
$x- > 1.$
$x- > 2.$
$x- > 2.68307$
$x- > -0.665507 - 1.15075I$
$x- > -0.665507 + 1.15075I$
$x- > -0.413628 - 1.39208I$
$x- > -0.413628 + 1.39208I$
$x- > -0.179212 - 1.53652I$
$x- > -0.179212 + 1.53652I$
$x- > 0.0381407 - 1.64556I$
$x- > 0.0381407 + 1.64556I$
$x- > 0.24573 - 1.73494I$
$x- > 0.24573 + 1.73494I$
$x- > 0.447561 - 1.81249I$
$x- > 0.447561 + 1.81249I$
$x- > 0.644848 - 1.87136I$
$x- > 0.644848 + 1.87136I$
$x- > 0.829575 - 1.89691I$
$x- > 0.829575 + 1.89691I$
$x- > 0.996522 - 1.88416I$
$x- > 0.996522 + 1.88416I$
$x- > 1.16022 - 1.84961I$
$x- > 1.16022 + 1.84961I$
$x- > 1.32045 - 1.80297I$
$x- > 1.32045 + 1.80297I$
$x- > 1.47763 - 1.74813I$
$x- > 1.47763 + 1.74813I$
$x- > 1.63237 - 1.68576I$
$x- > 1.63237 + 1.68576I$
$x- > 1.7848 - 1.61446I$
$x- > 1.7848 + 1.61446I$
$x- > 1.92871 - 1.5322I$
$x- > 1.92871 + 1.5322I$
$x- > 2.05733 - 1.4482I$
$x- > 2.05733 + 1.4482I$
$x- > 2.1665 - 1.36716I$
$x- > 2.1665 + 1.36716I$
$x- > 2.24719 - 1.2741I$
$x- > 2.24719 + 1.2741I$
$x- > 2.32178 - 1.15688I$
$x- > 2.32178 + 1.15688I$
$x- > 2.39632 - 1.03008I$
$x- > 2.39632 + 1.03008I$
$x- > 2.46655 - 0.897521I$
$x- > 2.46655 + 0.897521I$
$x- > 2.5293 - 0.761422I$
$x- > 2.5293 + 0.761422I$
$x- > 2.58386 - 0.626964I$
$x- > 2.58386 + 0.626964I$
$x- > 2.62792 - 0.496728I$
$x- > 2.62792 + 0.496728I$
$x- > 2.6577 - 0.369986I$
$x- > 2.6577 + 0.369986I$
$x- > 2.67438 - 0.245421I$
$x- > 2.67438 + 0.245421I$
$x- > 2.68142 - 0.122295I$
$x- > 2.68142 + 0.122295I$