**********9-CAGE-15**********

Edges of 9-CAGE-15:

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

Chromatic polynomial relative the tree basis:

$$
\begin{aligned}
P(9-CAGE-15,x) = {} & \\
& +1x*(x-1)^{57} \\
& -30x*(x-1)^{56} \\
& +465x*(x-1)^{55} \\
& -4960x*(x-1)^{54} \\
& +40920x*(x-1)^{53} \\
& -278256x*(x-1)^{52} \\
& +1623160x*(x-1)^{51} \\
& -8347680x*(x-1)^{50} \\
& +38607928x*(x-1)^{49} \\
& -163008778x*(x-1)^{48} \\
& +635699476x*(x-1)^{47} \\
& -2311295128x*(x-1)^{46} \\
& +7894342286x*(x-1)^{45} \\
& -25488485352x*(x-1)^{44} \\
& +78197165382x*(x-1)^{43} \\
& -228949151250x*(x-1)^{42} \\
& +642048200309x*(x-1)^{41} \\
& -1729833099890x*(x-1)^{40} \\
& +4489138854155x*(x-1)^{39} \\
& -11245424824164x*(x-1)^{38} \\
& +27240560225622x*(x-1)^{37} \\
& -63902492452342x*(x-1)^{36} \\
& +145342204419607x*(x-1)^{35} \\
& -320802054497891x*(x-1)^{34} \\
& +687625210170725x*(x-1)^{33} \\
& -1431989385001040x*(x-1)^{32} \\
& +2898128370037524x*(x-1)^{31} \\
& -5700574018802922x*(x-1)^{30} \\
& +10896728904657243x*(x-1)^{29} \\
& -20236053060653036x*(x-1)^{28} \\
& +36492700869816596x*(x-1)^{27} \\
& -63864239796654607x*(x-1)^{26} \\
& +108373497210891182x*(x-1)^{25} \\
& -178140362984653795x*(x-1)^{24} \\
& +283302097510374499x*(x-1)^{23} \\
& -435279200576107859x*(x-1)^{22} \\
& +645059167892726840x*(x-1)^{21} \\
& -920275602645303909x*(x-1)^{20} \\
& +1261170473730410584x*(x-1)^{19} \\
& -1656073003741391921x*(x-1)^{18} \\
& +2077726186313686925x*(x-1)^{17} \\
& -2482384186071794171x*(x-1)^{16} \\
& +2813667939657840768x*(x-1)^{15} \\
& -3012255947073894328x*(x-1)^{14} \\
& +3030431300031960958x*(x-1)^{13} \\
& -2847761853378906180x*(x-1)^{12} \\
& +2481996910675361647x*(x-1)^{11} \\
& -1989276334917383795x*(x-1)^{10} \\
& +1451049291558079236x*(x-1)^{9} \\
& -951006007142760574x*(x-1)^{8} \\
& +550963034749725166x*(x-1)^{7} \\
& -276215106273780148x*(x-1)^{6} \\
& +116400254092257008x*(x-1)^{5} \\
& -39541762400292418x*(x-1)^{4} \\
& +10138173327479188x*(x-1)^{3} \\
& -1741046422181200x*(x-1)^{2} \\
& +149895790352224x*(x-1)^{1}
\end{aligned}
$$

Chromatic polynomial relative the standard basis:

$$
\begin{aligned}
P(9-Cage-15,x) = \\
&-29763162413230015248x \\
&+419813193274134413612x^2 \\
&-2980508193027530114116x^3 \\
&+14214379879109904226925x^4 \\
&-51262275589893762194970x^5 \\
&+14917524777485008662362 4x^6 \\
&-36494625379391994294284 6x^7 \\
&+77201249580985154031713 9x^8 \\
&-14413278217036753142687 87x^9 \\
&+24118210859342014855926 18x^{10} \\
&-36607488746324095392332 97x^{11} \\
&+50880630369943957356612 51x^{12} \\
&-65252585634189484488194 15x^{13} \\
&+77693875399755205376187 89x^{14} \\
&-86319417230441542515976 84x^{15} \\
&+89857694617993811101808 24x^{16} \\
&-87941679197680382487933 77x^{17} \\
&+81138077834775787886166 61x^{18} \\
&-70731992974571271698506 33x^{19} \\
&+58364134191438444744512 68x^{20} \\
&-45648589772349076221380 73x^{21} \\
&+33878862292656051580381 31x^{22} \\
&-23877808388757938713902 19x^{23} \\
&+15990370221802729854433 44x^{24} \\
&-10177889839909153387094 18x^{25} \\
&+61580265483853756360671 4x^{26} \\
&-35414422819121290591938 7x^{27} \\
&+19354012701456516277824 2x^{28} \\
&-10047167817549403384792 1x^{29} \\
&+49518006873503309874279x^{30} \\
&-23154332597313014673822x^{31} \\
&+10263423390381969352276x^{32} \\
&-43084637049810594854 97x^{33} \\
&+17109551207778056082 72x^{34} \\
&-64193339977024909995 4x^{35} \\
&+22722425948316158045 5x^{36} \\
&-75758958985233193788x^{37} \\
&+23748944597807269226x^{38} \\
&-6985659611881615954x^{39} \\
&+1923702922602076094x^{40} \\
&-494684301414334022x^{41} \\
&+118448006205564332x^{42} \\
&-26322082620085850x^{43} \\
&+5408679817479600x^{44} \\
&-1023266792075184x^{45} \\
&+177366483435436x^{46} \\
&-28005249728686x^{47} \\
&+4000750753738x^{48} \\
&-512916793300x^{49} \\
&+58433559478x^{50} \\
&-5843355957x^{51} \\
&+504981379x^{52} \\
&-36949857x^{53} \\
&+2225895x^{54} \\
&-105995x^{55} \\
&+3741x^{56} \\
&-87x^{57} \\
&+1x^{58}
\end{aligned}
$$

Roots of the chromatic polynomial of 9-CAGE-15:

$x- > 0.$
$x- > 1.$
$x- > 2.$
$x- > 2.68465$
$x- > -0.668264 - 1.15132I$
$x- > -0.668264 + 1.15132I$
$x- > -0.41277 - 1.3898I$
$x- > -0.41277 + 1.3898I$
$x- > -0.179574 - 1.53742I$
$x- > -0.179574 + 1.53742I$
$x- > 0.0381809 - 1.6455I$
$x- > 0.0381809 + 1.6455I$
$x- > 0.245858 - 1.7359I$
$x- > 0.245858 + 1.7359I$
$x- > 0.447932 - 1.81447I$
$x- > 0.447932 + 1.81447I$
$x- > 0.644098 - 1.87481I$
$x- > 0.644098 + 1.87481I$
$x- > 0.825162 - 1.8937I$
$x- > 0.825162 + 1.8937I$
$x- > 0.995619 - 1.88071I$
$x- > 0.995619 + 1.88071I$
$x- > 1.16114 - 1.84838I$
$x- > 1.16114 + 1.84838I$
$x- > 1.32217 - 1.80391I$
$x- > 1.32217 + 1.80391I$
$x- > 1.48079 - 1.75144I$
$x- > 1.48079 + 1.75144I$
$x- > 1.63484 - 1.68942I$
$x- > 1.63484 + 1.68942I$
$x- > 1.78325 - 1.61714I$
$x- > 1.78325 + 1.61714I$
$x- > 1.92497 - 1.53304I$
$x- > 1.92497 + 1.53304I$
$x- > 2.05281 - 1.44835I$
$x- > 2.05281 + 1.44835I$
$x- > 2.16419 - 1.36078I$
$x- > 2.16419 + 1.36078I$
$x- > 2.25434 - 1.26988I$
$x- > 2.25434 + 1.26988I$
$x- > 2.32488 - 1.16081I$
$x- > 2.32488 + 1.16081I$
$x- > 2.39556 - 1.03341I$
$x- > 2.39556 + 1.03341I$
$x- > 2.46539 - 0.899768I$
$x- > 2.46539 + 0.899768I$
$x- > 2.52921 - 0.762654I$
$x- > 2.52921 + 0.762654I$
$x- > 2.5848 - 0.628049I$
$x- > 2.5848 + 0.628049I$
$x- > 2.6288 - 0.497498I$
$x- > 2.6288 + 0.497498I$
$x- > 2.65742 - 0.369095I$
$x- > 2.65742 + 0.369095I$
$x- > 2.67435 - 0.242902I$
$x- > 2.67435 + 0.242902I$
$x- > 2.68251 - 0.120138I$
$x- > 2.68251 + 0.120138I$