**Minimal Constraint Subsets found in 11-round trail~Zhang’s paper Figure2**

**Skinny64-192**

the 0 th Minimal Constraint set is:

y^2\_1 + x^3\_5 + k1\_7 + k2\_7\_1 + k3\_7\_1= 0

y^2\_1 + y^2\_11 + x^3\_13 + k1\_7 + k2\_7\_1 + k3\_7\_1= 0

[y^2\_4] + y^2\_11 + [x^3\_9] + k1\_2 + k2\_2\_1 + k3\_2\_1= 0

[y^3\_0] + y^3\_10 + y^3\_13 + [x^4\_0] + k1\_15 + k2\_15\_1 + k3\_15\_1= 0

y^3\_2 + x^4\_6 + k1\_9 + k2\_9\_1 + k3\_9\_1= 0

y^3\_2 + y^3\_8 + x^4\_14 + k1\_9 + k2\_9\_1 + k3\_9\_1= 0

y^3\_5 + y^3\_8 + x^4\_10 + k1\_12 + k2\_12\_1 + k3\_12\_1= 0

[y^3\_7] + y^3\_10 + [x^4\_8] + k1\_13 + k2\_13\_1 + k3\_13\_1= 0

[y^4\_0] + y^4\_10 + [y^4\_13] + x^5\_0 + k1\_7 + k2\_7\_2 + k3\_7\_2= 0

[y^4\_1] + [y^4\_11] + y^4\_14 + x^5\_1 + k1\_3 + k2\_3\_2 + k3\_3\_2= 0

[y^4\_2] + [y^4\_8] + x^5\_14 + k1\_1 + k2\_1\_2 + k3\_1\_2= 0

[y^4\_3] + y^4\_9 + [x^5\_15] + k1\_6 + k2\_6\_2 + k3\_6\_2= 0

y^4\_6 + y^4\_9 + x^5\_11 + k1\_2 + k2\_2\_2 + k3\_2\_2= 0

y^5\_0 + [y^5\_10] + [x^6\_12] + k1\_11 + k2\_11\_2 + k3\_11\_2= 0

y^5\_1 + y^5\_11 + y^5\_14 + x^6\_1 + k1\_13 + k2\_13\_2 + k3\_13\_2= 0

[y^5\_6] + [y^5\_9] + x^6\_11 + k1\_8 + k2\_8\_2 + k3\_8\_2= 0

y^6\_1 + y^6\_11 + [y^6\_14] + [x^7\_1] + k1\_5 + k2\_5\_3 + k3\_5\_3= 0

S(x^3\_5) + y^3\_5= 0

S(x^3\_13) + y^3\_13= 0

S(x^4\_6) + y^4\_6= 0

S(x^4\_10) + y^4\_10= 0

S(x^4\_14) + y^4\_14= 0

S(x^5\_0) + y^5\_0= 0

S(x^5\_1) + y^5\_1= 0

S(x^5\_11) + y^5\_11= 0

S(x^5\_14) + y^5\_14= 0

S(x^6\_1) + y^6\_1= 0

S(x^6\_11) + y^6\_11= 0

the 1 th Minimal Constraint set is:

y^1\_1 + x^2\_5 + k1\_15 + k2\_15\_0 + k3\_15\_0= 0

y^1\_1 + y^1\_11 + x^2\_13 + k1\_15 + k2\_15\_0 + k3\_15\_0= 0

y^1\_3 + y^1\_9 + [y^1\_12] + [x^2\_3] + k1\_13 + k2\_13\_0 + k3\_13\_0= 0

y^1\_3 + y^1\_9 + x^2\_15 + k1\_13 + k2\_13\_0 + k3\_13\_0= 0

[y^1\_4] + y^1\_11 + [x^2\_9] + k1\_10 + k2\_10\_0 + k3\_10\_0= 0

[y^2\_0] + y^2\_10 + y^2\_13 + [x^3\_0] + k1\_1 + k2\_1\_1 + k3\_1\_1= 0

[y^2\_0] + y^2\_10 + [x^3\_12] + k1\_1 + k2\_1\_1 + k3\_1\_1= 0

y^2\_2 + y^2\_8 + y^2\_15 + x^3\_2 + k1\_0 + k2\_0\_1 + k3\_0\_1= 0

y^2\_2 + x^3\_6 + k1\_0 + k2\_0\_1 + k3\_0\_1= 0

y^2\_5 + y^2\_8 + x^3\_10 + k1\_6 + k2\_6\_1 + k3\_6\_1= 0

y^3\_2 + x^4\_6 + k1\_9 + k2\_9\_1 + k3\_9\_1= 0

y^3\_6 + [y^3\_9] + [x^4\_11] + k1\_10 + k2\_10\_1 + k3\_10\_1= 0

[y^3\_7] + y^3\_10 + [x^4\_8] + k1\_13 + k2\_13\_1 + k3\_13\_1= 0

[y^4\_3] + y^4\_9 + [x^5\_15] + k1\_6 + k2\_6\_2 + k3\_6\_2= 0

y^4\_6 + y^4\_9 + x^5\_11 + k1\_2 + k2\_2\_2 + k3\_2\_2= 0

[y^5\_4] + y^5\_11 + [x^6\_9] + k1\_9 + k2\_9\_2 + k3\_9\_2= 0

S(x^2\_5) + y^2\_5= 0

S(x^2\_13) + y^2\_13= 0

S(x^2\_15) + y^2\_15= 0

S(x^3\_2) + y^3\_2= 0

S(x^3\_6) + y^3\_6= 0

S(x^3\_10) + y^3\_10= 0

S(x^4\_6) + y^4\_6= 0

S(x^5\_11) + y^5\_11= 0

the 2 th Minimal Constraint set is:

y^1\_1 + x^2\_5 + k1\_15 + k2\_15\_0 + k3\_15\_0= 0

y^1\_1 + y^1\_11 + x^2\_13 + k1\_15 + k2\_15\_0 + k3\_15\_0= 0

y^1\_3 + y^1\_9 + [y^1\_12] + [x^2\_3] + k1\_13 + k2\_13\_0 + k3\_13\_0= 0

y^1\_3 + y^1\_9 + x^2\_15 + k1\_13 + k2\_13\_0 + k3\_13\_0= 0

[y^1\_4] + y^1\_11 + [x^2\_9] + k1\_10 + k2\_10\_0 + k3\_10\_0= 0

[y^2\_0] + y^2\_10 + y^2\_13 + [x^3\_0] + k1\_1 + k2\_1\_1 + k3\_1\_1= 0

[y^2\_0] + y^2\_10 + [x^3\_12] + k1\_1 + k2\_1\_1 + k3\_1\_1= 0

y^2\_1 + x^3\_5 + k1\_7 + k2\_7\_1 + k3\_7\_1= 0

y^2\_1 + y^2\_11 + x^3\_13 + k1\_7 + k2\_7\_1 + k3\_7\_1= 0

y^2\_2 + y^2\_8 + y^2\_15 + x^3\_2 + k1\_0 + k2\_0\_1 + k3\_0\_1= 0

y^2\_2 + x^3\_6 + k1\_0 + k2\_0\_1 + k3\_0\_1= 0

[y^2\_3] + [y^2\_9] + [y^2\_12] + x^3\_3 + k1\_5 + k2\_5\_1 + k3\_5\_1= 0

[y^2\_4] + y^2\_11 + [x^3\_9] + k1\_2 + k2\_2\_1 + k3\_2\_1= 0

y^2\_5 + y^2\_8 + x^3\_10 + k1\_6 + k2\_6\_1 + k3\_6\_1= 0

[y^3\_0] + y^3\_10 + y^3\_13 + [x^4\_0] + k1\_15 + k2\_15\_1 + k3\_15\_1= 0

y^3\_2 + y^3\_8 + x^4\_14 + k1\_9 + k2\_9\_1 + k3\_9\_1= 0

y^3\_3 + x^4\_7 + k1\_14 + k2\_14\_1 + k3\_14\_1= 0

y^3\_5 + y^3\_8 + x^4\_10 + k1\_12 + k2\_12\_1 + k3\_12\_1= 0

y^3\_6 + [y^3\_9] + [x^4\_11] + k1\_10 + k2\_10\_1 + k3\_10\_1= 0

[y^4\_1] + [y^4\_11] + y^4\_14 + x^5\_1 + k1\_3 + k2\_3\_2 + k3\_3\_2= 0

y^4\_7 + y^4\_10 + x^5\_8 + k1\_5 + k2\_5\_2 + k3\_5\_2= 0

y^5\_1 + x^6\_5 + k1\_13 + k2\_13\_2 + k3\_13\_2= 0

[y^5\_2] + y^5\_8 + [y^5\_15] + x^6\_2 + k1\_15 + k2\_15\_2 + k3\_15\_2= 0

[y^5\_3] + [y^5\_9] + x^6\_15 + k1\_12 + k2\_12\_2 + k3\_12\_2= 0

y^6\_2 + y^6\_8 + y^6\_15 + x^7\_2 + k1\_7 + k2\_7\_3 + k3\_7\_3= 0

y^6\_5 + y^6\_8 + x^7\_10 + k1\_2 + k2\_2\_3 + k3\_2\_3= 0

[y^6\_7] + [y^6\_10] + x^7\_8 + k1\_6 + k2\_6\_3 + k3\_6\_3= 0

y^7\_2 + y^7\_8 + [y^7\_15] + [x^8\_2] + k1\_11 + k2\_11\_3 + k3\_11\_3= 0

[y^7\_7] + y^7\_10 + [x^8\_8] + k1\_12 + k2\_12\_3 + k3\_12\_3= 0

S(x^2\_5) + y^2\_5= 0

S(x^2\_13) + y^2\_13= 0

S(x^2\_15) + y^2\_15= 0

S(x^3\_2) + y^3\_2= 0

S(x^3\_3) + y^3\_3= 0

S(x^3\_5) + y^3\_5= 0

S(x^3\_6) + y^3\_6= 0

S(x^3\_10) + y^3\_10= 0

S(x^3\_13) + y^3\_13= 0

S(x^4\_7) + y^4\_7= 0

S(x^4\_10) + y^4\_10= 0

S(x^4\_14) + y^4\_14= 0

S(x^5\_1) + y^5\_1= 0

S(x^5\_8) + y^5\_8= 0

S(x^6\_2) + y^6\_2= 0

S(x^6\_5) + y^6\_5= 0

S(x^6\_15) + y^6\_15= 0

S(x^7\_2) + y^7\_2= 0

S(x^7\_8) + y^7\_8= 0

S(x^7\_10) + y^7\_10= 0

the 3 th Minimal Constraint set is:

[y^2\_3] + [y^2\_9] + [y^2\_12] + x^3\_3 + k1\_5 + k2\_5\_1 + k3\_5\_1= 0

y^3\_3 + x^4\_7 + k1\_14 + k2\_14\_1 + k3\_14\_1= 0

[y^4\_0] + y^4\_10 + [y^4\_13] + x^5\_0 + k1\_7 + k2\_7\_2 + k3\_7\_2= 0

y^4\_7 + y^4\_10 + x^5\_8 + k1\_5 + k2\_5\_2 + k3\_5\_2= 0

y^5\_0 + [y^5\_10] + [x^6\_12] + k1\_11 + k2\_11\_2 + k3\_11\_2= 0

[y^5\_2] + y^5\_8 + [y^5\_15] + x^6\_2 + k1\_15 + k2\_15\_2 + k3\_15\_2= 0

[y^5\_3] + [y^5\_9] + x^6\_15 + k1\_12 + k2\_12\_2 + k3\_12\_2= 0

[y^5\_7] + [y^5\_10] + x^6\_8 + k1\_14 + k2\_14\_2 + k3\_14\_2= 0

y^6\_2 + y^6\_8 + y^6\_15 + x^7\_2 + k1\_7 + k2\_7\_3 + k3\_7\_3= 0

[y^6\_7] + [y^6\_10] + x^7\_8 + k1\_6 + k2\_6\_3 + k3\_6\_3= 0

y^7\_2 + y^7\_8 + [y^7\_15] + [x^8\_2] + k1\_11 + k2\_11\_3 + k3\_11\_3= 0

S(x^3\_3) + y^3\_3= 0

S(x^4\_7) + y^4\_7= 0

S(x^5\_0) + y^5\_0= 0

S(x^5\_8) + y^5\_8= 0

S(x^6\_2) + y^6\_2= 0

S(x^6\_8) + y^6\_8= 0

S(x^6\_15) + y^6\_15= 0

S(x^7\_2) + y^7\_2= 0

S(x^7\_8) + y^7\_8= 0

the 4 th Minimal Constraint set is:

[y^4\_1] + [y^4\_11] + x^5\_13 + k1\_3 + k2\_3\_2 + k3\_3\_2= 0

y^5\_0 + [y^5\_10] + y^5\_13 + [x^6\_0] + k1\_11 + k2\_11\_2 + k3\_11\_2= 0

y^5\_0 + [y^5\_10] + [x^6\_12] + k1\_11 + k2\_11\_2 + k3\_11\_2= 0

S(x^5\_13) + y^5\_13= 0

the 5 th Minimal Constraint set is:

[y^2\_3] + [y^2\_9] + [y^2\_12] + x^3\_3 + k1\_5 + k2\_5\_1 + k3\_5\_1= 0

y^3\_3 + x^4\_7 + k1\_14 + k2\_14\_1 + k3\_14\_1= 0

[y^4\_0] + y^4\_10 + [y^4\_13] + x^5\_0 + k1\_7 + k2\_7\_2 + k3\_7\_2= 0

y^4\_7 + y^4\_10 + x^5\_8 + k1\_5 + k2\_5\_2 + k3\_5\_2= 0

y^5\_0 + [y^5\_10] + [x^6\_12] + k1\_11 + k2\_11\_2 + k3\_11\_2= 0

[y^5\_5] + y^5\_8 + [x^6\_10] + k1\_10 + k2\_10\_2 + k3\_10\_2= 0

S(x^3\_3) + y^3\_3= 0

S(x^4\_7) + y^4\_7= 0

S(x^5\_0) + y^5\_0= 0

S(x^5\_8) + y^5\_8= 0

the 6 th Minimal Constraint set is:

[y^2\_3] + [y^2\_9] + [y^2\_12] + x^3\_3 + k1\_5 + k2\_5\_1 + k3\_5\_1= 0

y^3\_3 + x^4\_7 + k1\_14 + k2\_14\_1 + k3\_14\_1= 0

[y^4\_0] + y^4\_10 + [y^4\_13] + x^5\_0 + k1\_7 + k2\_7\_2 + k3\_7\_2= 0

y^4\_7 + y^4\_10 + x^5\_8 + k1\_5 + k2\_5\_2 + k3\_5\_2= 0

y^5\_0 + [y^5\_10] + [x^6\_12] + k1\_11 + k2\_11\_2 + k3\_11\_2= 0

[y^5\_2] + y^5\_8 + [x^6\_14] + k1\_15 + k2\_15\_2 + k3\_15\_2= 0

S(x^3\_3) + y^3\_3= 0

S(x^4\_7) + y^4\_7= 0

S(x^5\_0) + y^5\_0= 0

S(x^5\_8) + y^5\_8= 0

the 7 th Minimal Constraint set is:

[y^4\_0] + y^4\_10 + [y^4\_13] + x^5\_0 + k1\_7 + k2\_7\_2 + k3\_7\_2= 0

[y^4\_0] + y^4\_10 + [x^5\_12] + k1\_7 + k2\_7\_2 + k3\_7\_2= 0

y^5\_0 + [y^5\_10] + [x^6\_12] + k1\_11 + k2\_11\_2 + k3\_11\_2= 0

S(x^5\_0) + y^5\_0= 0

the 8 th Minimal Constraint set is:

y^1\_1 + x^2\_5 + k1\_15 + k2\_15\_0 + k3\_15\_0= 0

y^1\_1 + y^1\_11 + x^2\_13 + k1\_15 + k2\_15\_0 + k3\_15\_0= 0

y^1\_3 + y^1\_9 + [y^1\_12] + [x^2\_3] + k1\_13 + k2\_13\_0 + k3\_13\_0= 0

y^1\_3 + y^1\_9 + x^2\_15 + k1\_13 + k2\_13\_0 + k3\_13\_0= 0

[y^1\_4] + y^1\_11 + [x^2\_9] + k1\_10 + k2\_10\_0 + k3\_10\_0= 0

[y^2\_0] + y^2\_10 + y^2\_13 + [x^3\_0] + k1\_1 + k2\_1\_1 + k3\_1\_1= 0

[y^2\_0] + y^2\_10 + [x^3\_12] + k1\_1 + k2\_1\_1 + k3\_1\_1= 0

y^2\_1 + x^3\_5 + k1\_7 + k2\_7\_1 + k3\_7\_1= 0

y^2\_1 + y^2\_11 + x^3\_13 + k1\_7 + k2\_7\_1 + k3\_7\_1= 0

y^2\_2 + y^2\_8 + y^2\_15 + x^3\_2 + k1\_0 + k2\_0\_1 + k3\_0\_1= 0

y^2\_2 + x^3\_6 + k1\_0 + k2\_0\_1 + k3\_0\_1= 0

[y^2\_4] + y^2\_11 + [x^3\_9] + k1\_2 + k2\_2\_1 + k3\_2\_1= 0

y^2\_5 + y^2\_8 + x^3\_10 + k1\_6 + k2\_6\_1 + k3\_6\_1= 0

[y^3\_0] + y^3\_10 + y^3\_13 + [x^4\_0] + k1\_15 + k2\_15\_1 + k3\_15\_1= 0

y^3\_2 + y^3\_8 + [y^3\_15] + [x^4\_2] + k1\_9 + k2\_9\_1 + k3\_9\_1= 0

y^3\_5 + y^3\_8 + x^4\_10 + k1\_12 + k2\_12\_1 + k3\_12\_1= 0

y^3\_6 + [y^3\_9] + [x^4\_11] + k1\_10 + k2\_10\_1 + k3\_10\_1= 0

[y^4\_0] + y^4\_10 + [y^4\_13] + x^5\_0 + k1\_7 + k2\_7\_2 + k3\_7\_2= 0

y^5\_0 + [y^5\_10] + [x^6\_12] + k1\_11 + k2\_11\_2 + k3\_11\_2= 0

S(x^2\_5) + y^2\_5= 0

S(x^2\_13) + y^2\_13= 0

S(x^2\_15) + y^2\_15= 0

S(x^3\_2) + y^3\_2= 0

S(x^3\_5) + y^3\_5= 0

S(x^3\_6) + y^3\_6= 0

S(x^3\_10) + y^3\_10= 0

S(x^3\_13) + y^3\_13= 0

S(x^4\_10) + y^4\_10= 0

S(x^5\_0) + y^5\_0= 0

the 9 th Minimal Constraint set is:

[y^3\_4] + [y^3\_11] + x^4\_9 + k1\_8 + k2\_8\_1 + k3\_8\_1= 0

[y^4\_3] + y^4\_9 + [x^5\_15] + k1\_6 + k2\_6\_2 + k3\_6\_2= 0

S(x^4\_9) + y^4\_9= 0

the 10 th Minimal Constraint set is:

[y^4\_3] + y^4\_9 + [y^4\_12] + [x^5\_3] + k1\_6 + k2\_6\_2 + k3\_6\_2= 0

[y^4\_3] + y^4\_9 + [x^5\_15] + k1\_6 + k2\_6\_2 + k3\_6\_2= 0

the 11 th Minimal Constraint set is:

y^1\_1 + x^2\_5 + k1\_15 + k2\_15\_0 + k3\_15\_0= 0

y^1\_1 + y^1\_11 + x^2\_13 + k1\_15 + k2\_15\_0 + k3\_15\_0= 0

[y^1\_4] + y^1\_11 + [x^2\_9] + k1\_10 + k2\_10\_0 + k3\_10\_0= 0

[y^2\_0] + y^2\_10 + y^2\_13 + [x^3\_0] + k1\_1 + k2\_1\_1 + k3\_1\_1= 0

[y^2\_0] + y^2\_10 + [x^3\_12] + k1\_1 + k2\_1\_1 + k3\_1\_1= 0

y^2\_2 + x^3\_6 + k1\_0 + k2\_0\_1 + k3\_0\_1= 0

y^2\_2 + y^2\_8 + x^3\_14 + k1\_0 + k2\_0\_1 + k3\_0\_1= 0

y^2\_5 + y^2\_8 + x^3\_10 + k1\_6 + k2\_6\_1 + k3\_6\_1= 0

y^3\_1 + [y^3\_11] + y^3\_14 + [x^4\_1] + k1\_11 + k2\_11\_1 + k3\_11\_1= 0

y^3\_1 + x^4\_5 + k1\_11 + k2\_11\_1 + k3\_11\_1= 0

y^3\_6 + [y^3\_9] + [x^4\_11] + k1\_10 + k2\_10\_1 + k3\_10\_1= 0

[y^3\_7] + y^3\_10 + [x^4\_8] + k1\_13 + k2\_13\_1 + k3\_13\_1= 0

y^4\_5 + [y^4\_8] + [x^5\_10] + k1\_4 + k2\_4\_2 + k3\_4\_2= 0

S(x^2\_5) + y^2\_5= 0

S(x^2\_13) + y^2\_13= 0

S(x^3\_6) + y^3\_6= 0

S(x^3\_10) + y^3\_10= 0

S(x^3\_14) + y^3\_14= 0

S(x^4\_5) + y^4\_5= 0

the 12 th Minimal Constraint set is:

y^1\_1 + x^2\_5 + k1\_15 + k2\_15\_0 + k3\_15\_0= 0

y^1\_1 + y^1\_11 + x^2\_13 + k1\_15 + k2\_15\_0 + k3\_15\_0= 0

[y^1\_4] + y^1\_11 + [x^2\_9] + k1\_10 + k2\_10\_0 + k3\_10\_0= 0

[y^2\_0] + y^2\_10 + y^2\_13 + [x^3\_0] + k1\_1 + k2\_1\_1 + k3\_1\_1= 0

[y^2\_0] + y^2\_10 + [x^3\_12] + k1\_1 + k2\_1\_1 + k3\_1\_1= 0

y^2\_2 + x^3\_6 + k1\_0 + k2\_0\_1 + k3\_0\_1= 0

y^2\_2 + y^2\_8 + x^3\_14 + k1\_0 + k2\_0\_1 + k3\_0\_1= 0

y^2\_5 + y^2\_8 + x^3\_10 + k1\_6 + k2\_6\_1 + k3\_6\_1= 0

y^3\_1 + [y^3\_11] + y^3\_14 + [x^4\_1] + k1\_11 + k2\_11\_1 + k3\_11\_1= 0

y^3\_1 + [y^3\_11] + [x^4\_13] + k1\_11 + k2\_11\_1 + k3\_11\_1= 0

y^3\_6 + [y^3\_9] + [x^4\_11] + k1\_10 + k2\_10\_1 + k3\_10\_1= 0

[y^3\_7] + y^3\_10 + [x^4\_8] + k1\_13 + k2\_13\_1 + k3\_13\_1= 0

S(x^2\_5) + y^2\_5= 0

S(x^2\_13) + y^2\_13= 0

S(x^3\_6) + y^3\_6= 0

S(x^3\_10) + y^3\_10= 0

S(x^3\_14) + y^3\_14= 0

the 13 th Minimal Constraint set is:

[y^3\_0] + y^3\_10 + [x^4\_12] + k1\_15 + k2\_15\_1 + k3\_15\_1= 0

[y^3\_7] + y^3\_10 + [x^4\_8] + k1\_13 + k2\_13\_1 + k3\_13\_1= 0

the 14 th Minimal Constraint set is:

[y^2\_3] + [y^2\_9] + [y^2\_12] + x^3\_3 + k1\_5 + k2\_5\_1 + k3\_5\_1= 0

y^3\_3 + [y^3\_9] + [x^4\_15] + k1\_14 + k2\_14\_1 + k3\_14\_1= 0

S(x^3\_3) + y^3\_3= 0

the 15 th Minimal Constraint set is:

[y^2\_3] + [y^2\_9] + [y^2\_12] + x^3\_3 + k1\_5 + k2\_5\_1 + k3\_5\_1= 0

y^3\_3 + [y^3\_9] + [y^3\_12] + [x^4\_3] + k1\_14 + k2\_14\_1 + k3\_14\_1= 0

S(x^3\_3) + y^3\_3= 0

the 16 th Minimal Constraint set is:

[y^0\_0] + [x^1\_4] + k1\_0 + k2\_0\_0 + k3\_0\_0= 0

the 17 th Minimal Constraint set is:

[y^1\_0] + [x^2\_4] + k1\_9 + k2\_9\_0 + k3\_9\_0= 0

the 18 th Minimal Constraint set is:

[y^2\_0] + [x^3\_4] + k1\_1 + k2\_1\_1 + k3\_1\_1= 0

the 19 th Minimal Constraint set is:

[y^2\_3] + [x^3\_7] + k1\_5 + k2\_5\_1 + k3\_5\_1= 0

the 20 th Minimal Constraint set is:

[y^2\_3] + [y^2\_9] + [x^3\_15] + k1\_5 + k2\_5\_1 + k3\_5\_1= 0

the 21 th Minimal Constraint set is:

[y^3\_0] + [x^4\_4] + k1\_15 + k2\_15\_1 + k3\_15\_1= 0

the 22 th Minimal Constraint set is:

[y^4\_0] + [x^5\_4] + k1\_7 + k2\_7\_2 + k3\_7\_2= 0

the 23 th Minimal Constraint set is:

[y^4\_1] + [x^5\_5] + k1\_3 + k2\_3\_2 + k3\_3\_2= 0

the 24 th Minimal Constraint set is:

[y^4\_2] + [y^4\_8] + [y^4\_15] + [x^5\_2] + k1\_1 + k2\_1\_2 + k3\_1\_2= 0

the 25 th Minimal Constraint set is:

[y^4\_2] + [x^5\_6] + k1\_1 + k2\_1\_2 + k3\_1\_2= 0

the 26 th Minimal Constraint set is:

[y^4\_3] + [x^5\_7] + k1\_6 + k2\_6\_2 + k3\_6\_2= 0

the 27 th Minimal Constraint set is:

[y^4\_4] + [y^4\_11] + [x^5\_9] + k1\_0 + k2\_0\_2 + k3\_0\_2= 0

the 28 th Minimal Constraint set is:

[y^5\_2] + [x^6\_6] + k1\_15 + k2\_15\_2 + k3\_15\_2= 0

the 29 th Minimal Constraint set is:

[y^5\_3] + [y^5\_9] + [y^5\_12] + [x^6\_3] + k1\_12 + k2\_12\_2 + k3\_12\_2= 0

the 30 th Minimal Constraint set is:

[y^5\_3] + [x^6\_7] + k1\_12 + k2\_12\_2 + k3\_12\_2= 0

the 31 th Minimal Constraint set is:

[y^6\_0] + [x^7\_4] + k1\_3 + k2\_3\_3 + k3\_3\_3= 0

the 32 th Minimal Constraint set is:

[y^6\_3] + [x^7\_7] + k1\_4 + k2\_4\_3 + k3\_4\_3= 0

the 33 th Minimal Constraint set is:

[y^6\_3] + [y^6\_9] + [x^7\_15] + k1\_4 + k2\_4\_3 + k3\_4\_3= 0

the 34 th Minimal Constraint set is:

[y^6\_6] + [y^6\_9] + [x^7\_11] + k1\_0 + k2\_0\_3 + k3\_0\_3= 0

the 35 th Minimal Constraint set is:

[y^7\_1] + [x^8\_5] + k1\_14 + k2\_14\_3 + k3\_14\_3= 0

the 36 th Minimal Constraint set is:

[y^8\_2] + [x^9\_6] + k1\_3 + k2\_3\_4 + k3\_3\_4= 0

the 37 th Minimal Constraint set is:

S([x^0\_0]) + [y^0\_0]= 0