**Minimal Constraint Subsets Detected for differential trail in Table 9 DDH21+**

SKINNY-128-384

the 0 th Minimal Constraint set is:

[y^1\_1] + y^1\_11 + [y^1\_14] + x^2\_1 + 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^2\_1 + x^3\_5 + k1\_7 + k2\_7\_1 + k3\_7\_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\_2 + x^4\_6 + 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^4\_0 + x^5\_4 + k1\_7 + k2\_7\_2 + k3\_7\_2= 0

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

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

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

y^4\_6 + y^4\_9 + x^5\_11 + k1\_2 + k2\_2\_2 + k3\_2\_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] + y^5\_13 + x^6\_0 + 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\_2 + x^6\_6 + k1\_15 + k2\_15\_2 + k3\_15\_2= 0

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

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

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

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

y^6\_0 + y^6\_10 + x^7\_12 + k1\_3 + k2\_3\_3 + k3\_3\_3= 0

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

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

[y^6\_4] + [y^6\_11] + x^7\_9 + k1\_1 + k2\_1\_3 + k3\_1\_3= 0

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

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

y^7\_0 + y^7\_10 + [y^7\_13] + [x^8\_0] + k1\_13 + k2\_13\_3 + k3\_13\_3= 0

y^7\_0 + y^7\_10 + x^8\_12 + k1\_13 + k2\_13\_3 + k3\_13\_3= 0

y^7\_1 + y^7\_11 + x^8\_13 + k1\_14 + k2\_14\_3 + k3\_14\_3= 0

y^7\_2 + y^7\_8 + x^8\_14 + k1\_11 + k2\_11\_3 + k3\_11\_3= 0

y^7\_3 + y^7\_9 + y^7\_12 + x^8\_3 + k1\_10 + k2\_10\_3 + k3\_10\_3= 0

y^7\_3 + x^8\_7 + k1\_10 + k2\_10\_3 + k3\_10\_3= 0

[y^8\_0] + y^8\_10 + y^8\_13 + x^9\_0 + k1\_5 + k2\_5\_4 + k3\_5\_4= 0

[y^8\_0] + x^9\_4 + k1\_5 + k2\_5\_4 + k3\_5\_4= 0

y^8\_1 + y^8\_11 + y^8\_14 + x^9\_1 + k1\_6 + k2\_6\_4 + k3\_6\_4= 0

y^8\_1 + y^8\_11 + x^9\_13 + k1\_6 + k2\_6\_4 + k3\_6\_4= 0

y^8\_3 + y^8\_9 + y^8\_12 + x^9\_3 + k1\_2 + k2\_2\_4 + k3\_2\_4= 0

y^8\_3 + x^9\_7 + k1\_2 + k2\_2\_4 + k3\_2\_4= 0

y^8\_3 + y^8\_9 + x^9\_15 + k1\_2 + k2\_2\_4 + k3\_2\_4= 0

y^8\_7 + y^8\_10 + x^9\_8 + k1\_4 + k2\_4\_4 + k3\_4\_4= 0

y^9\_0 + y^9\_10 + y^9\_13 + x^10\_0 + k1\_14 + k2\_14\_4 + k3\_14\_4= 0

y^9\_1 + y^9\_11 + x^10\_13 + k1\_12 + k2\_12\_4 + k3\_12\_4= 0

y^9\_2 + y^9\_8 + y^9\_15 + x^10\_2 + k1\_13 + k2\_13\_4 + k3\_13\_4= 0

y^9\_2 + x^10\_6 + k1\_13 + k2\_13\_4 + k3\_13\_4= 0

y^9\_3 + x^10\_7 + k1\_8 + k2\_8\_4 + k3\_8\_4= 0

y^9\_4 + y^9\_11 + x^10\_9 + k1\_11 + k2\_11\_4 + k3\_11\_4= 0

y^9\_7 + y^9\_10 + x^10\_8 + k1\_10 + k2\_10\_4 + k3\_10\_4= 0

y^10\_0 + y^10\_10 + y^10\_13 + x^11\_0 + k1\_6 + k2\_6\_5 + k3\_6\_5= 0

y^10\_2 + y^10\_8 + x^11\_14 + k1\_5 + k2\_5\_5 + k3\_5\_5= 0

y^10\_6 + y^10\_9 + x^11\_11 + k1\_7 + k2\_7\_5 + k3\_7\_5= 0

y^10\_7 + y^10\_10 + x^11\_8 + k1\_2 + k2\_2\_5 + k3\_2\_5= 0

y^11\_0 + x^12\_4 + k1\_12 + k2\_12\_5 + k3\_12\_5= 0

y^11\_1 + y^11\_11 + y^11\_14 + x^12\_1 + k1\_10 + k2\_10\_5 + k3\_10\_5= 0

y^11\_1 + x^12\_5 + k1\_10 + k2\_10\_5 + k3\_10\_5= 0

y^11\_2 + x^12\_6 + k1\_14 + k2\_14\_5 + k3\_14\_5= 0

y^11\_2 + y^11\_8 + x^12\_14 + k1\_14 + k2\_14\_5 + k3\_14\_5= 0

y^12\_1 + y^12\_11 + y^12\_14 + x^13\_1 + k1\_2 + k2\_2\_6 + k3\_2\_6= 0

y^12\_2 + x^13\_6 + k1\_6 + k2\_6\_6 + k3\_6\_6= 0

y^12\_2 + y^12\_8 + x^13\_14 + k1\_6 + k2\_6\_6 + k3\_6\_6= 0

y^12\_3 + x^13\_7 + k1\_1 + k2\_1\_6 + k3\_1\_6= 0

y^12\_3 + y^12\_9 + x^13\_15 + k1\_1 + k2\_1\_6 + k3\_1\_6= 0

y^12\_4 + y^12\_11 + x^13\_9 + k1\_5 + k2\_5\_6 + k3\_5\_6= 0

y^12\_5 + y^12\_8 + x^13\_10 + k1\_7 + k2\_7\_6 + k3\_7\_6= 0

y^12\_6 + y^12\_9 + x^13\_11 + k1\_3 + k2\_3\_6 + k3\_3\_6= 0

y^13\_1 + y^13\_11 + y^13\_14 + x^14\_1 + k1\_8 + k2\_8\_6 + k3\_8\_6= 0

y^13\_2 + y^13\_8 + y^13\_15 + x^14\_2 + k1\_12 + k2\_12\_6 + k3\_12\_6= 0

y^13\_2 + y^13\_8 + x^14\_14 + k1\_12 + k2\_12\_6 + k3\_12\_6= 0

y^13\_6 + y^13\_9 + x^14\_11 + k1\_13 + k2\_13\_6 + k3\_13\_6= 0

y^13\_7 + y^13\_10 + x^14\_8 + k1\_9 + k2\_9\_6 + k3\_9\_6= 0

y^14\_1 + y^14\_11 + y^14\_14 + x^15\_1 + k1\_0 + k2\_0\_7 + k3\_0\_7= 0

y^14\_2 + y^14\_8 + x^15\_14 + k1\_4 + k2\_4\_7 + k3\_4\_7= 0

y^15\_1 + [y^15\_11] + y^15\_14 + [x^16\_1] + k1\_9 + k2\_9\_7 + k3\_9\_7= 0

S(x^2\_1) + y^2\_1= 0

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

S(x^4\_0) + y^4\_0= 0

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

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

S(x^5\_4) + y^5\_4= 0

S(x^5\_9) + y^5\_9= 0

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

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

S(x^6\_0) + y^6\_0= 0

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

S(x^6\_6) + y^6\_6= 0

S(x^6\_7) + y^6\_7= 0

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

S(x^6\_9) + y^6\_9= 0

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

S(x^7\_1) + y^7\_1= 0

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

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

S(x^7\_9) + y^7\_9= 0

S(x^7\_11) + y^7\_11= 0

S(x^7\_12) + y^7\_12= 0

S(x^8\_3) + y^8\_3= 0

S(x^8\_7) + y^8\_7= 0

S(x^8\_12) + y^8\_12= 0

S(x^8\_13) + y^8\_13= 0

S(x^8\_14) + y^8\_14= 0

S(x^9\_0) + y^9\_0= 0

S(x^9\_1) + y^9\_1= 0

S(x^9\_3) + y^9\_3= 0

S(x^9\_4) + y^9\_4= 0

S(x^9\_7) + y^9\_7= 0

S(x^9\_8) + y^9\_8= 0

S(x^9\_13) + y^9\_13= 0

S(x^9\_15) + y^9\_15= 0

S(x^10\_0) + y^10\_0= 0

S(x^10\_2) + y^10\_2= 0

S(x^10\_6) + y^10\_6= 0

S(x^10\_7) + y^10\_7= 0

S(x^10\_8) + y^10\_8= 0

S(x^10\_9) + y^10\_9= 0

S(x^10\_13) + y^10\_13= 0

S(x^11\_0) + y^11\_0= 0

S(x^11\_8) + y^11\_8= 0

S(x^11\_11) + y^11\_11= 0

S(x^11\_14) + y^11\_14= 0

S(x^12\_1) + y^12\_1= 0

S(x^12\_4) + y^12\_4= 0

S(x^12\_5) + y^12\_5= 0

S(x^12\_6) + y^12\_6= 0

S(x^12\_14) + y^12\_14= 0

S(x^13\_1) + y^13\_1= 0

S(x^13\_6) + y^13\_6= 0

S(x^13\_7) + y^13\_7= 0

S(x^13\_9) + y^13\_9= 0

S(x^13\_10) + y^13\_10= 0

S(x^13\_11) + y^13\_11= 0

S(x^13\_14) + y^13\_14= 0

S(x^13\_15) + y^13\_15= 0

S(x^14\_1) + y^14\_1= 0

S(x^14\_2) + y^14\_2= 0

S(x^14\_8) + y^14\_8= 0

S(x^14\_11) + y^14\_11= 0

S(x^14\_14) + y^14\_14= 0

S(x^15\_1) + y^15\_1= 0

S(x^15\_14) + y^15\_14= 0

the 1 th Minimal Constraint set is:

[y^1\_1] + y^1\_11 + [y^1\_14] + x^2\_1 + 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^2\_1 + x^3\_5 + k1\_7 + k2\_7\_1 + k3\_7\_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^4\_0 + y^4\_10 + x^5\_12 + 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\_1] + [y^4\_11] + x^5\_13 + k1\_3 + k2\_3\_2 + k3\_3\_2= 0

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

[y^4\_4] + [y^4\_11] + x^5\_9 + k1\_0 + k2\_0\_2 + k3\_0\_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] + y^5\_13 + x^6\_0 + k1\_11 + k2\_11\_2 + k3\_11\_2= 0

y^5\_1 + y^5\_11 + x^6\_13 + 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\_2 + x^6\_6 + k1\_15 + k2\_15\_2 + k3\_15\_2= 0

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

y^5\_3 + x^6\_7 + 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\_0 + y^6\_10 + y^6\_13 + x^7\_0 + k1\_3 + k2\_3\_3 + k3\_3\_3= 0

y^6\_2 + y^6\_8 + x^7\_14 + k1\_7 + k2\_7\_3 + k3\_7\_3= 0

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

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

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

y^7\_0 + x^8\_4 + k1\_13 + k2\_13\_3 + k3\_13\_3= 0

y^7\_1 + y^7\_11 + y^7\_14 + x^8\_1 + k1\_14 + k2\_14\_3 + k3\_14\_3= 0

y^7\_1 + x^8\_5 + k1\_14 + k2\_14\_3 + k3\_14\_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\_2 + x^8\_6 + k1\_11 + k2\_11\_3 + k3\_11\_3= 0

[y^8\_0] + x^9\_4 + k1\_5 + k2\_5\_4 + k3\_5\_4= 0

y^8\_1 + y^8\_11 + x^9\_13 + k1\_6 + k2\_6\_4 + k3\_6\_4= 0

y^8\_2 + y^8\_8 + x^9\_14 + k1\_3 + k2\_3\_4 + k3\_3\_4= 0

y^8\_3 + x^9\_7 + k1\_2 + k2\_2\_4 + k3\_2\_4= 0

y^8\_3 + y^8\_9 + x^9\_15 + k1\_2 + k2\_2\_4 + k3\_2\_4= 0

y^8\_4 + y^8\_11 + x^9\_9 + k1\_7 + k2\_7\_4 + k3\_7\_4= 0

y^8\_5 + y^8\_8 + x^9\_10 + k1\_0 + k2\_0\_4 + k3\_0\_4= 0

y^8\_6 + y^8\_9 + x^9\_11 + k1\_1 + k2\_1\_4 + k3\_1\_4= 0

y^9\_0 + y^9\_10 + y^9\_13 + x^10\_0 + k1\_14 + k2\_14\_4 + k3\_14\_4= 0

y^9\_0 + y^9\_10 + x^10\_12 + k1\_14 + k2\_14\_4 + k3\_14\_4= 0

y^9\_1 + y^9\_11 + y^9\_14 + x^10\_1 + k1\_12 + k2\_12\_4 + k3\_12\_4= 0

y^9\_1 + y^9\_11 + x^10\_13 + k1\_12 + k2\_12\_4 + k3\_12\_4= 0

y^9\_2 + y^9\_8 + y^9\_15 + x^10\_2 + k1\_13 + k2\_13\_4 + k3\_13\_4= 0

y^9\_2 + y^9\_8 + x^10\_14 + k1\_13 + k2\_13\_4 + k3\_13\_4= 0

y^9\_3 + x^10\_7 + k1\_8 + k2\_8\_4 + k3\_8\_4= 0

y^9\_3 + y^9\_9 + x^10\_15 + k1\_8 + k2\_8\_4 + k3\_8\_4= 0

y^9\_4 + y^9\_11 + x^10\_9 + k1\_11 + k2\_11\_4 + k3\_11\_4= 0

y^9\_7 + y^9\_10 + x^10\_8 + k1\_10 + k2\_10\_4 + k3\_10\_4= 0

y^10\_0 + y^10\_10 + y^10\_13 + x^11\_0 + k1\_6 + k2\_6\_5 + k3\_6\_5= 0

y^10\_1 + y^10\_11 + y^10\_14 + x^11\_1 + k1\_4 + k2\_4\_5 + k3\_4\_5= 0

y^10\_1 + x^11\_5 + k1\_4 + k2\_4\_5 + k3\_4\_5= 0

y^10\_1 + y^10\_11 + x^11\_13 + k1\_4 + k2\_4\_5 + k3\_4\_5= 0

y^10\_2 + y^10\_8 + y^10\_15 + x^11\_2 + k1\_5 + k2\_5\_5 + k3\_5\_5= 0

y^10\_3 + y^10\_9 + y^10\_12 + x^11\_3 + k1\_0 + k2\_0\_5 + k3\_0\_5= 0

y^10\_3 + x^11\_7 + k1\_0 + k2\_0\_5 + k3\_0\_5= 0

y^10\_7 + y^10\_10 + x^11\_8 + k1\_2 + k2\_2\_5 + k3\_2\_5= 0

y^11\_0 + y^11\_10 + y^11\_13 + x^12\_0 + k1\_12 + k2\_12\_5 + k3\_12\_5= 0

y^11\_1 + x^12\_5 + k1\_10 + k2\_10\_5 + k3\_10\_5= 0

y^11\_2 + x^12\_6 + k1\_14 + k2\_14\_5 + k3\_14\_5= 0

y^11\_3 + x^12\_7 + k1\_9 + k2\_9\_5 + k3\_9\_5= 0

y^11\_5 + y^11\_8 + x^12\_10 + k1\_15 + k2\_15\_5 + k3\_15\_5= 0

y^11\_7 + y^11\_10 + x^12\_8 + k1\_8 + k2\_8\_5 + k3\_8\_5= 0

y^12\_0 + x^13\_4 + k1\_4 + k2\_4\_6 + k3\_4\_6= 0

y^12\_3 + x^13\_7 + k1\_1 + k2\_1\_6 + k3\_1\_6= 0

y^12\_3 + y^12\_9 + x^13\_15 + k1\_1 + k2\_1\_6 + k3\_1\_6= 0

y^12\_5 + y^12\_8 + x^13\_10 + k1\_7 + k2\_7\_6 + k3\_7\_6= 0

y^12\_6 + y^12\_9 + x^13\_11 + k1\_3 + k2\_3\_6 + k3\_3\_6= 0

y^12\_7 + y^12\_10 + x^13\_8 + k1\_0 + k2\_0\_6 + k3\_0\_6= 0

y^13\_2 + y^13\_8 + y^13\_15 + x^14\_2 + k1\_12 + k2\_12\_6 + k3\_12\_6= 0

y^13\_2 + x^14\_6 + k1\_12 + k2\_12\_6 + k3\_12\_6= 0

y^13\_4 + y^13\_11 + x^14\_9 + k1\_14 + k2\_14\_6 + k3\_14\_6= 0

y^13\_7 + y^13\_10 + x^14\_8 + k1\_9 + k2\_9\_6 + k3\_9\_6= 0

y^14\_2 + y^14\_8 + x^15\_14 + k1\_4 + k2\_4\_7 + k3\_4\_7= 0

y^14\_6 + y^14\_9 + [x^15\_11] + k1\_5 + k2\_5\_7 + k3\_5\_7= 0

y^15\_1 + [y^15\_11] + y^15\_14 + [x^16\_1] + k1\_9 + k2\_9\_7 + k3\_9\_7= 0

y^15\_1 + [y^15\_11] + [x^16\_13] + k1\_9 + k2\_9\_7 + k3\_9\_7= 0

S(x^2\_1) + y^2\_1= 0

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

S(x^4\_0) + y^4\_0= 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\_1) + y^5\_1= 0

S(x^5\_9) + y^5\_9= 0

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

S(x^5\_12) + y^5\_12= 0

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

S(x^6\_0) + y^6\_0= 0

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

S(x^6\_3) + y^6\_3= 0

S(x^6\_6) + y^6\_6= 0

S(x^6\_7) + y^6\_7= 0

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

S(x^6\_13) + y^6\_13= 0

S(x^7\_0) + y^7\_0= 0

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

S(x^7\_11) + y^7\_11= 0

S(x^7\_14) + y^7\_14= 0

S(x^7\_15) + y^7\_15= 0

S(x^8\_1) + y^8\_1= 0

S(x^8\_2) + y^8\_2= 0

S(x^8\_4) + y^8\_4= 0

S(x^8\_5) + y^8\_5= 0

S(x^8\_6) + y^8\_6= 0

S(x^9\_4) + y^9\_4= 0

S(x^9\_7) + y^9\_7= 0

S(x^9\_9) + y^9\_9= 0

S(x^9\_10) + y^9\_10= 0

S(x^9\_11) + y^9\_11= 0

S(x^9\_13) + y^9\_13= 0

S(x^9\_14) + y^9\_14= 0

S(x^9\_15) + y^9\_15= 0

S(x^10\_0) + y^10\_0= 0

S(x^10\_1) + y^10\_1= 0

S(x^10\_2) + y^10\_2= 0

S(x^10\_7) + y^10\_7= 0

S(x^10\_8) + y^10\_8= 0

S(x^10\_9) + y^10\_9= 0

S(x^10\_12) + y^10\_12= 0

S(x^10\_13) + y^10\_13= 0

S(x^10\_14) + y^10\_14= 0

S(x^10\_15) + y^10\_15= 0

S(x^11\_0) + y^11\_0= 0

S(x^11\_1) + y^11\_1= 0

S(x^11\_2) + y^11\_2= 0

S(x^11\_3) + y^11\_3= 0

S(x^11\_5) + y^11\_5= 0

S(x^11\_7) + y^11\_7= 0

S(x^11\_8) + y^11\_8= 0

S(x^11\_13) + y^11\_13= 0

S(x^12\_0) + y^12\_0= 0

S(x^12\_5) + y^12\_5= 0

S(x^12\_6) + y^12\_6= 0

S(x^12\_7) + y^12\_7= 0

S(x^12\_8) + y^12\_8= 0

S(x^12\_10) + y^12\_10= 0

S(x^13\_4) + y^13\_4= 0

S(x^13\_7) + y^13\_7= 0

S(x^13\_8) + y^13\_8= 0

S(x^13\_10) + y^13\_10= 0

S(x^13\_11) + y^13\_11= 0

S(x^13\_15) + y^13\_15= 0

S(x^14\_2) + y^14\_2= 0

S(x^14\_6) + y^14\_6= 0

S(x^14\_8) + y^14\_8= 0

S(x^14\_9) + y^14\_9= 0

S(x^15\_14) + y^15\_14= 0

the 2 th Minimal Constraint set is:

[y^1\_1] + y^1\_11 + [y^1\_14] + x^2\_1 + 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^2\_1 + x^3\_5 + k1\_7 + k2\_7\_1 + k3\_7\_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\_2 + x^4\_6 + 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^4\_0 + x^5\_4 + k1\_7 + k2\_7\_2 + k3\_7\_2= 0

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

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

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

y^4\_6 + y^4\_9 + x^5\_11 + k1\_2 + k2\_2\_2 + k3\_2\_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] + 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

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

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

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

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

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

y^6\_0 + y^6\_10 + x^7\_12 + k1\_3 + k2\_3\_3 + k3\_3\_3= 0

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

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

y^6\_2 + x^7\_6 + k1\_7 + k2\_7\_3 + k3\_7\_3= 0

y^6\_2 + y^6\_8 + x^7\_14 + k1\_7 + k2\_7\_3 + k3\_7\_3= 0

y^6\_3 + y^6\_9 + y^6\_12 + x^7\_3 + k1\_4 + k2\_4\_3 + k3\_4\_3= 0

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

[y^6\_4] + [y^6\_11] + x^7\_9 + k1\_1 + k2\_1\_3 + k3\_1\_3= 0

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

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

y^7\_1 + y^7\_11 + y^7\_14 + x^8\_1 + k1\_14 + k2\_14\_3 + k3\_14\_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\_3 + y^7\_9 + y^7\_12 + x^8\_3 + k1\_10 + k2\_10\_3 + k3\_10\_3= 0

y^7\_3 + x^8\_7 + k1\_10 + k2\_10\_3 + k3\_10\_3= 0

y^7\_3 + y^7\_9 + x^8\_15 + k1\_10 + k2\_10\_3 + k3\_10\_3= 0

y^7\_6 + y^7\_9 + x^8\_11 + k1\_9 + k2\_9\_3 + k3\_9\_3= 0

[y^8\_0] + y^8\_10 + x^9\_12 + k1\_5 + k2\_5\_4 + k3\_5\_4= 0

y^8\_1 + y^8\_11 + x^9\_13 + k1\_6 + k2\_6\_4 + k3\_6\_4= 0

y^8\_2 + y^8\_8 + y^8\_15 + x^9\_2 + k1\_3 + k2\_3\_4 + k3\_3\_4= 0

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

y^8\_2 + y^8\_8 + x^9\_14 + k1\_3 + k2\_3\_4 + k3\_3\_4= 0

y^8\_3 + x^9\_7 + k1\_2 + k2\_2\_4 + k3\_2\_4= 0

y^8\_7 + y^8\_10 + x^9\_8 + k1\_4 + k2\_4\_4 + k3\_4\_4= 0

y^9\_0 + y^9\_10 + y^9\_13 + x^10\_0 + k1\_14 + k2\_14\_4 + k3\_14\_4= 0

y^9\_0 + x^10\_4 + k1\_14 + k2\_14\_4 + k3\_14\_4= 0

y^9\_1 + y^9\_11 + y^9\_14 + x^10\_1 + k1\_12 + k2\_12\_4 + k3\_12\_4= 0

y^9\_1 + y^9\_11 + x^10\_13 + k1\_12 + k2\_12\_4 + k3\_12\_4= 0

y^9\_2 + y^9\_8 + x^10\_14 + k1\_13 + k2\_13\_4 + k3\_13\_4= 0

y^9\_3 + y^9\_9 + y^9\_12 + x^10\_3 + k1\_8 + k2\_8\_4 + k3\_8\_4= 0

y^9\_3 + x^10\_7 + k1\_8 + k2\_8\_4 + k3\_8\_4= 0

y^9\_6 + y^9\_9 + x^10\_11 + k1\_15 + k2\_15\_4 + k3\_15\_4= 0

y^9\_7 + y^9\_10 + x^10\_8 + k1\_10 + k2\_10\_4 + k3\_10\_4= 0

y^10\_0 + y^10\_10 + y^10\_13 + x^11\_0 + k1\_6 + k2\_6\_5 + k3\_6\_5= 0

y^10\_1 + y^10\_11 + y^10\_14 + x^11\_1 + k1\_4 + k2\_4\_5 + k3\_4\_5= 0

y^10\_1 + x^11\_5 + k1\_4 + k2\_4\_5 + k3\_4\_5= 0

y^10\_1 + y^10\_11 + x^11\_13 + k1\_4 + k2\_4\_5 + k3\_4\_5= 0

y^10\_2 + x^11\_6 + k1\_5 + k2\_5\_5 + k3\_5\_5= 0

y^10\_2 + y^10\_8 + x^11\_14 + k1\_5 + k2\_5\_5 + k3\_5\_5= 0

y^10\_3 + x^11\_7 + k1\_0 + k2\_0\_5 + k3\_0\_5= 0

y^10\_4 + y^10\_11 + x^11\_9 + k1\_3 + k2\_3\_5 + k3\_3\_5= 0

y^10\_7 + y^10\_10 + x^11\_8 + k1\_2 + k2\_2\_5 + k3\_2\_5= 0

y^11\_0 + y^11\_10 + y^11\_13 + x^12\_0 + k1\_12 + k2\_12\_5 + k3\_12\_5= 0

y^11\_1 + y^11\_11 + y^11\_14 + x^12\_1 + k1\_10 + k2\_10\_5 + k3\_10\_5= 0

y^11\_1 + x^12\_5 + k1\_10 + k2\_10\_5 + k3\_10\_5= 0

y^11\_1 + y^11\_11 + x^12\_13 + k1\_10 + k2\_10\_5 + k3\_10\_5= 0

y^11\_5 + y^11\_8 + x^12\_10 + k1\_15 + k2\_15\_5 + k3\_15\_5= 0

y^11\_6 + y^11\_9 + x^12\_11 + k1\_11 + k2\_11\_5 + k3\_11\_5= 0

y^11\_7 + y^11\_10 + x^12\_8 + k1\_8 + k2\_8\_5 + k3\_8\_5= 0

y^12\_0 + y^12\_10 + y^12\_13 + x^13\_0 + k1\_4 + k2\_4\_6 + k3\_4\_6= 0

y^12\_1 + y^12\_11 + x^13\_13 + k1\_2 + k2\_2\_6 + k3\_2\_6= 0

y^12\_5 + y^12\_8 + x^13\_10 + k1\_7 + k2\_7\_6 + k3\_7\_6= 0

y^13\_0 + y^13\_10 + y^13\_13 + x^14\_0 + k1\_10 + k2\_10\_6 + k3\_10\_6= 0

y^14\_0 + x^15\_4 + k1\_2 + k2\_2\_7 + k3\_2\_7= 0

y^15\_4 + [y^15\_11] + [x^16\_9] + k1\_12 + k2\_12\_7 + k3\_12\_7= 0

S(x^2\_1) + y^2\_1= 0

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

S(x^4\_0) + y^4\_0= 0

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

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

S(x^5\_4) + y^5\_4= 0

S(x^5\_9) + y^5\_9= 0

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

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

S(x^6\_0) + y^6\_0= 0

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

S(x^6\_6) + y^6\_6= 0

S(x^6\_7) + y^6\_7= 0

S(x^6\_9) + y^6\_9= 0

S(x^6\_12) + y^6\_12= 0

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

S(x^7\_1) + y^7\_1= 0

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

S(x^7\_3) + y^7\_3= 0

S(x^7\_6) + y^7\_6= 0

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

S(x^7\_9) + y^7\_9= 0

S(x^7\_11) + y^7\_11= 0

S(x^7\_12) + y^7\_12= 0

S(x^7\_14) + y^7\_14= 0

S(x^7\_15) + y^7\_15= 0

S(x^8\_1) + y^8\_1= 0

S(x^8\_2) + y^8\_2= 0

S(x^8\_3) + y^8\_3= 0

S(x^8\_7) + y^8\_7= 0

S(x^8\_11) + y^8\_11= 0

S(x^8\_15) + y^8\_15= 0

S(x^9\_2) + y^9\_2= 0

S(x^9\_6) + y^9\_6= 0

S(x^9\_7) + y^9\_7= 0

S(x^9\_8) + y^9\_8= 0

S(x^9\_12) + y^9\_12= 0

S(x^9\_13) + y^9\_13= 0

S(x^9\_14) + y^9\_14= 0

S(x^10\_0) + y^10\_0= 0

S(x^10\_1) + y^10\_1= 0

S(x^10\_3) + y^10\_3= 0

S(x^10\_4) + y^10\_4= 0

S(x^10\_7) + y^10\_7= 0

S(x^10\_8) + y^10\_8= 0

S(x^10\_11) + y^10\_11= 0

S(x^10\_13) + y^10\_13= 0

S(x^10\_14) + y^10\_14= 0

S(x^11\_0) + y^11\_0= 0

S(x^11\_1) + y^11\_1= 0

S(x^11\_5) + y^11\_5= 0

S(x^11\_6) + y^11\_6= 0

S(x^11\_7) + y^11\_7= 0

S(x^11\_8) + y^11\_8= 0

S(x^11\_9) + y^11\_9= 0

S(x^11\_13) + y^11\_13= 0

S(x^11\_14) + y^11\_14= 0

S(x^12\_0) + y^12\_0= 0

S(x^12\_1) + y^12\_1= 0

S(x^12\_5) + y^12\_5= 0

S(x^12\_8) + y^12\_8= 0

S(x^12\_10) + y^12\_10= 0

S(x^12\_11) + y^12\_11= 0

S(x^12\_13) + y^12\_13= 0

S(x^13\_0) + y^13\_0= 0

S(x^13\_10) + y^13\_10= 0

S(x^13\_13) + y^13\_13= 0

S(x^14\_0) + y^14\_0= 0

S(x^15\_4) + y^15\_4= 0

the 3 th Minimal Constraint set is:

[y^1\_1] + y^1\_11 + [y^1\_14] + x^2\_1 + 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^2\_1 + x^3\_5 + k1\_7 + k2\_7\_1 + k3\_7\_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\_2 + x^4\_6 + 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\_2] + y^4\_8 + [y^4\_15] + x^5\_2 + 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\_4] + [y^4\_11] + x^5\_9 + k1\_0 + k2\_0\_2 + k3\_0\_2= 0

y^4\_6 + y^4\_9 + x^5\_11 + k1\_2 + k2\_2\_2 + k3\_2\_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\_1 + x^6\_5 + k1\_13 + k2\_13\_2 + k3\_13\_2= 0

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

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

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

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

y^6\_0 + y^6\_10 + y^6\_13 + x^7\_0 + k1\_3 + k2\_3\_3 + k3\_3\_3= 0

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

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

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

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

y^6\_2 + x^7\_6 + k1\_7 + k2\_7\_3 + k3\_7\_3= 0

y^6\_3 + y^6\_9 + y^6\_12 + x^7\_3 + k1\_4 + k2\_4\_3 + k3\_4\_3= 0

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

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

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

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

y^7\_0 + x^8\_4 + k1\_13 + k2\_13\_3 + k3\_13\_3= 0

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

y^7\_2 + x^8\_6 + k1\_11 + k2\_11\_3 + k3\_11\_3= 0

y^7\_3 + y^7\_9 + x^8\_15 + k1\_10 + k2\_10\_3 + k3\_10\_3= 0

y^7\_4 + y^7\_11 + x^8\_9 + k1\_15 + k2\_15\_3 + k3\_15\_3= 0

y^7\_5 + y^7\_8 + x^8\_10 + k1\_8 + k2\_8\_3 + k3\_8\_3= 0

y^7\_6 + y^7\_9 + x^8\_11 + k1\_9 + k2\_9\_3 + k3\_9\_3= 0

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

[y^8\_0] + x^9\_4 + k1\_5 + k2\_5\_4 + k3\_5\_4= 0

[y^8\_0] + y^8\_10 + x^9\_12 + k1\_5 + k2\_5\_4 + k3\_5\_4= 0

y^8\_2 + y^8\_8 + y^8\_15 + x^9\_2 + k1\_3 + k2\_3\_4 + k3\_3\_4= 0

y^8\_2 + y^8\_8 + x^9\_14 + k1\_3 + k2\_3\_4 + k3\_3\_4= 0

y^8\_4 + y^8\_11 + x^9\_9 + k1\_7 + k2\_7\_4 + k3\_7\_4= 0

y^8\_5 + y^8\_8 + x^9\_10 + k1\_0 + k2\_0\_4 + k3\_0\_4= 0

y^8\_6 + y^8\_9 + x^9\_11 + k1\_1 + k2\_1\_4 + k3\_1\_4= 0

y^9\_0 + x^10\_4 + k1\_14 + k2\_14\_4 + k3\_14\_4= 0

y^9\_0 + y^9\_10 + x^10\_12 + k1\_14 + k2\_14\_4 + k3\_14\_4= 0

y^9\_1 + y^9\_11 + y^9\_14 + x^10\_1 + k1\_12 + k2\_12\_4 + k3\_12\_4= 0

y^9\_1 + y^9\_11 + x^10\_13 + k1\_12 + k2\_12\_4 + k3\_12\_4= 0

y^9\_2 + x^10\_6 + k1\_13 + k2\_13\_4 + k3\_13\_4= 0

y^9\_3 + y^9\_9 + y^9\_12 + x^10\_3 + k1\_8 + k2\_8\_4 + k3\_8\_4= 0

y^9\_3 + x^10\_7 + k1\_8 + k2\_8\_4 + k3\_8\_4= 0

y^9\_4 + y^9\_11 + x^10\_9 + k1\_11 + k2\_11\_4 + k3\_11\_4= 0

y^10\_0 + y^10\_10 + y^10\_13 + x^11\_0 + k1\_6 + k2\_6\_5 + k3\_6\_5= 0

y^10\_0 + x^11\_4 + k1\_6 + k2\_6\_5 + k3\_6\_5= 0

y^10\_1 + y^10\_11 + x^11\_13 + k1\_4 + k2\_4\_5 + k3\_4\_5= 0

y^10\_3 + y^10\_9 + y^10\_12 + x^11\_3 + k1\_0 + k2\_0\_5 + k3\_0\_5= 0

y^10\_3 + x^11\_7 + k1\_0 + k2\_0\_5 + k3\_0\_5= 0

y^10\_3 + y^10\_9 + x^11\_15 + k1\_0 + k2\_0\_5 + k3\_0\_5= 0

y^10\_4 + y^10\_11 + x^11\_9 + k1\_3 + k2\_3\_5 + k3\_3\_5= 0

y^10\_6 + y^10\_9 + x^11\_11 + k1\_7 + k2\_7\_5 + k3\_7\_5= 0

y^10\_7 + y^10\_10 + x^11\_8 + k1\_2 + k2\_2\_5 + k3\_2\_5= 0

y^11\_0 + y^11\_10 + y^11\_13 + x^12\_0 + k1\_12 + k2\_12\_5 + k3\_12\_5= 0

y^11\_2 + y^11\_8 + y^11\_15 + x^12\_2 + k1\_14 + k2\_14\_5 + k3\_14\_5= 0

y^11\_2 + x^12\_6 + k1\_14 + k2\_14\_5 + k3\_14\_5= 0

y^11\_3 + y^11\_9 + x^12\_15 + k1\_9 + k2\_9\_5 + k3\_9\_5= 0

y^11\_4 + y^11\_11 + x^12\_9 + k1\_13 + k2\_13\_5 + k3\_13\_5= 0

y^11\_7 + y^11\_10 + x^12\_8 + k1\_8 + k2\_8\_5 + k3\_8\_5= 0

y^12\_0 + x^13\_4 + k1\_4 + k2\_4\_6 + k3\_4\_6= 0

y^12\_2 + y^12\_8 + y^12\_15 + x^13\_2 + k1\_6 + k2\_6\_6 + k3\_6\_6= 0

y^12\_6 + y^12\_9 + x^13\_11 + k1\_3 + k2\_3\_6 + k3\_3\_6= 0

y^13\_2 + x^14\_6 + k1\_12 + k2\_12\_6 + k3\_12\_6= 0

y^13\_4 + y^13\_11 + x^14\_9 + k1\_14 + k2\_14\_6 + k3\_14\_6= 0

y^14\_6 + y^14\_9 + [x^15\_11] + k1\_5 + k2\_5\_7 + k3\_5\_7= 0

S(x^2\_1) + y^2\_1= 0

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

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

S(x^4\_8) + y^4\_8= 0

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

S(x^5\_2) + y^5\_2= 0

S(x^5\_9) + y^5\_9= 0

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

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

S(x^6\_6) + y^6\_6= 0

S(x^6\_7) + y^6\_7= 0

S(x^6\_12) + y^6\_12= 0

S(x^6\_13) + y^6\_13= 0

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

S(x^7\_0) + y^7\_0= 0

S(x^7\_1) + y^7\_1= 0

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

S(x^7\_3) + y^7\_3= 0

S(x^7\_4) + y^7\_4= 0

S(x^7\_5) + y^7\_5= 0

S(x^7\_6) + y^7\_6= 0

S(x^7\_7) + y^7\_7= 0

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

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

S(x^7\_11) + y^7\_11= 0

S(x^8\_4) + y^8\_4= 0

S(x^8\_5) + y^8\_5= 0

S(x^8\_6) + y^8\_6= 0

S(x^8\_8) + y^8\_8= 0

S(x^8\_9) + y^8\_9= 0

S(x^8\_10) + y^8\_10= 0

S(x^8\_11) + y^8\_11= 0

S(x^8\_15) + y^8\_15= 0

S(x^9\_2) + y^9\_2= 0

S(x^9\_4) + y^9\_4= 0

S(x^9\_9) + y^9\_9= 0

S(x^9\_10) + y^9\_10= 0

S(x^9\_11) + y^9\_11= 0

S(x^9\_12) + y^9\_12= 0

S(x^9\_14) + y^9\_14= 0

S(x^10\_1) + y^10\_1= 0

S(x^10\_3) + y^10\_3= 0

S(x^10\_4) + y^10\_4= 0

S(x^10\_6) + y^10\_6= 0

S(x^10\_7) + y^10\_7= 0

S(x^10\_9) + y^10\_9= 0

S(x^10\_12) + y^10\_12= 0

S(x^10\_13) + y^10\_13= 0

S(x^11\_0) + y^11\_0= 0

S(x^11\_3) + y^11\_3= 0

S(x^11\_4) + y^11\_4= 0

S(x^11\_7) + y^11\_7= 0

S(x^11\_8) + y^11\_8= 0

S(x^11\_9) + y^11\_9= 0

S(x^11\_11) + y^11\_11= 0

S(x^11\_13) + y^11\_13= 0

S(x^11\_15) + y^11\_15= 0

S(x^12\_0) + y^12\_0= 0

S(x^12\_2) + y^12\_2= 0

S(x^12\_6) + y^12\_6= 0

S(x^12\_8) + y^12\_8= 0

S(x^12\_9) + y^12\_9= 0

S(x^12\_15) + y^12\_15= 0

S(x^13\_2) + y^13\_2= 0

S(x^13\_4) + y^13\_4= 0

S(x^13\_11) + y^13\_11= 0

S(x^14\_6) + y^14\_6= 0

S(x^14\_9) + y^14\_9= 0

the 4 th Minimal Constraint set is:

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

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

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

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

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

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

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

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

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

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

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

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

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

y^6\_2 + x^7\_6 + k1\_7 + k2\_7\_3 + k3\_7\_3= 0

y^6\_3 + y^6\_9 + y^6\_12 + x^7\_3 + k1\_4 + k2\_4\_3 + k3\_4\_3= 0

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

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

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

y^7\_0 + y^7\_10 + [y^7\_13] + [x^8\_0] + k1\_13 + k2\_13\_3 + k3\_13\_3= 0

y^7\_0 + x^8\_4 + k1\_13 + k2\_13\_3 + k3\_13\_3= 0

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

y^7\_2 + x^8\_6 + k1\_11 + k2\_11\_3 + k3\_11\_3= 0

y^7\_3 + y^7\_9 + x^8\_15 + k1\_10 + k2\_10\_3 + k3\_10\_3= 0

y^7\_4 + y^7\_11 + x^8\_9 + k1\_15 + k2\_15\_3 + k3\_15\_3= 0

y^7\_5 + y^7\_8 + x^8\_10 + k1\_8 + k2\_8\_3 + k3\_8\_3= 0

y^7\_6 + y^7\_9 + x^8\_11 + k1\_9 + k2\_9\_3 + k3\_9\_3= 0

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

[y^8\_0] + x^9\_4 + k1\_5 + k2\_5\_4 + k3\_5\_4= 0

[y^8\_0] + y^8\_10 + x^9\_12 + k1\_5 + k2\_5\_4 + k3\_5\_4= 0

y^8\_2 + y^8\_8 + y^8\_15 + x^9\_2 + k1\_3 + k2\_3\_4 + k3\_3\_4= 0

y^8\_2 + y^8\_8 + x^9\_14 + k1\_3 + k2\_3\_4 + k3\_3\_4= 0

y^8\_4 + y^8\_11 + x^9\_9 + k1\_7 + k2\_7\_4 + k3\_7\_4= 0

y^8\_5 + y^8\_8 + x^9\_10 + k1\_0 + k2\_0\_4 + k3\_0\_4= 0

y^8\_6 + y^8\_9 + x^9\_11 + k1\_1 + k2\_1\_4 + k3\_1\_4= 0

y^9\_0 + x^10\_4 + k1\_14 + k2\_14\_4 + k3\_14\_4= 0

y^9\_0 + y^9\_10 + x^10\_12 + k1\_14 + k2\_14\_4 + k3\_14\_4= 0

y^9\_1 + y^9\_11 + y^9\_14 + x^10\_1 + k1\_12 + k2\_12\_4 + k3\_12\_4= 0

y^9\_1 + y^9\_11 + x^10\_13 + k1\_12 + k2\_12\_4 + k3\_12\_4= 0

y^9\_2 + x^10\_6 + k1\_13 + k2\_13\_4 + k3\_13\_4= 0

y^9\_3 + y^9\_9 + y^9\_12 + x^10\_3 + k1\_8 + k2\_8\_4 + k3\_8\_4= 0

y^9\_3 + x^10\_7 + k1\_8 + k2\_8\_4 + k3\_8\_4= 0

y^9\_4 + y^9\_11 + x^10\_9 + k1\_11 + k2\_11\_4 + k3\_11\_4= 0

y^10\_0 + y^10\_10 + y^10\_13 + x^11\_0 + k1\_6 + k2\_6\_5 + k3\_6\_5= 0

y^10\_0 + x^11\_4 + k1\_6 + k2\_6\_5 + k3\_6\_5= 0

y^10\_1 + y^10\_11 + x^11\_13 + k1\_4 + k2\_4\_5 + k3\_4\_5= 0

y^10\_3 + y^10\_9 + y^10\_12 + x^11\_3 + k1\_0 + k2\_0\_5 + k3\_0\_5= 0

y^10\_3 + x^11\_7 + k1\_0 + k2\_0\_5 + k3\_0\_5= 0

y^10\_3 + y^10\_9 + x^11\_15 + k1\_0 + k2\_0\_5 + k3\_0\_5= 0

y^10\_4 + y^10\_11 + x^11\_9 + k1\_3 + k2\_3\_5 + k3\_3\_5= 0

y^10\_6 + y^10\_9 + x^11\_11 + k1\_7 + k2\_7\_5 + k3\_7\_5= 0

y^10\_7 + y^10\_10 + x^11\_8 + k1\_2 + k2\_2\_5 + k3\_2\_5= 0

y^11\_0 + y^11\_10 + y^11\_13 + x^12\_0 + k1\_12 + k2\_12\_5 + k3\_12\_5= 0

y^11\_2 + y^11\_8 + y^11\_15 + x^12\_2 + k1\_14 + k2\_14\_5 + k3\_14\_5= 0

y^11\_2 + x^12\_6 + k1\_14 + k2\_14\_5 + k3\_14\_5= 0

y^11\_3 + y^11\_9 + x^12\_15 + k1\_9 + k2\_9\_5 + k3\_9\_5= 0

y^11\_4 + y^11\_11 + x^12\_9 + k1\_13 + k2\_13\_5 + k3\_13\_5= 0

y^11\_7 + y^11\_10 + x^12\_8 + k1\_8 + k2\_8\_5 + k3\_8\_5= 0

y^12\_0 + x^13\_4 + k1\_4 + k2\_4\_6 + k3\_4\_6= 0

y^12\_2 + y^12\_8 + y^12\_15 + x^13\_2 + k1\_6 + k2\_6\_6 + k3\_6\_6= 0

y^12\_6 + y^12\_9 + x^13\_11 + k1\_3 + k2\_3\_6 + k3\_3\_6= 0

y^13\_2 + x^14\_6 + k1\_12 + k2\_12\_6 + k3\_12\_6= 0

y^13\_4 + y^13\_11 + x^14\_9 + k1\_14 + k2\_14\_6 + k3\_14\_6= 0

y^14\_6 + y^14\_9 + [x^15\_11] + k1\_5 + k2\_5\_7 + k3\_5\_7= 0

S(x^4\_8) + y^4\_8= 0

S(x^5\_2) + y^5\_2= 0

S(x^5\_9) + y^5\_9= 0

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

S(x^6\_0) + y^6\_0= 0

S(x^6\_6) + y^6\_6= 0

S(x^6\_7) + y^6\_7= 0

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

S(x^6\_10) + y^6\_10= 0

S(x^6\_12) + y^6\_12= 0

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

S(x^7\_1) + y^7\_1= 0

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

S(x^7\_3) + y^7\_3= 0

S(x^7\_4) + y^7\_4= 0

S(x^7\_5) + y^7\_5= 0

S(x^7\_6) + y^7\_6= 0

S(x^7\_7) + y^7\_7= 0

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

S(x^7\_11) + y^7\_11= 0

S(x^8\_4) + y^8\_4= 0

S(x^8\_5) + y^8\_5= 0

S(x^8\_6) + y^8\_6= 0

S(x^8\_8) + y^8\_8= 0

S(x^8\_9) + y^8\_9= 0

S(x^8\_10) + y^8\_10= 0

S(x^8\_11) + y^8\_11= 0

S(x^8\_15) + y^8\_15= 0

S(x^9\_2) + y^9\_2= 0

S(x^9\_4) + y^9\_4= 0

S(x^9\_9) + y^9\_9= 0

S(x^9\_10) + y^9\_10= 0

S(x^9\_11) + y^9\_11= 0

S(x^9\_12) + y^9\_12= 0

S(x^9\_14) + y^9\_14= 0

S(x^10\_1) + y^10\_1= 0

S(x^10\_3) + y^10\_3= 0

S(x^10\_4) + y^10\_4= 0

S(x^10\_6) + y^10\_6= 0

S(x^10\_7) + y^10\_7= 0

S(x^10\_9) + y^10\_9= 0

S(x^10\_12) + y^10\_12= 0

S(x^10\_13) + y^10\_13= 0

S(x^11\_0) + y^11\_0= 0

S(x^11\_3) + y^11\_3= 0

S(x^11\_4) + y^11\_4= 0

S(x^11\_7) + y^11\_7= 0

S(x^11\_8) + y^11\_8= 0

S(x^11\_9) + y^11\_9= 0

S(x^11\_11) + y^11\_11= 0

S(x^11\_13) + y^11\_13= 0

S(x^11\_15) + y^11\_15= 0

S(x^12\_0) + y^12\_0= 0

S(x^12\_2) + y^12\_2= 0

S(x^12\_6) + y^12\_6= 0

S(x^12\_8) + y^12\_8= 0

S(x^12\_9) + y^12\_9= 0

S(x^12\_15) + y^12\_15= 0

S(x^13\_2) + y^13\_2= 0

S(x^13\_4) + y^13\_4= 0

S(x^13\_11) + y^13\_11= 0

S(x^14\_6) + y^14\_6= 0

S(x^14\_9) + y^14\_9= 0

the 5 th Minimal Constraint set is:

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

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

S(x^5\_9) + y^5\_9= 0

the 6 th Minimal Constraint set is:

y^0\_1 + y^0\_11 + [y^0\_14] + [x^1\_1] + k1\_1 + k2\_1\_0 + k3\_1\_0= 0

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

[y^0\_5] + [y^0\_8] + x^1\_10 + k1\_5 + k2\_5\_0 + k3\_5\_0= 0

y^1\_0 + y^1\_10 + y^1\_13 + x^2\_0 + k1\_9 + k2\_9\_0 + k3\_9\_0= 0

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

y^1\_3 + x^2\_7 + 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\_6] + y^1\_9 + [x^2\_11] + k1\_12 + k2\_12\_0 + k3\_12\_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\_2 + y^2\_8 + y^2\_15 + x^3\_2 + 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\_4 + [y^2\_11] + [x^3\_9] + k1\_2 + k2\_2\_1 + k3\_2\_1= 0

y^2\_7 + y^2\_10 + x^3\_8 + k1\_3 + k2\_3\_1 + k3\_3\_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\_2 + y^3\_8 + [y^3\_15] + [x^4\_2] + k1\_9 + k2\_9\_1 + k3\_9\_1= 0

S(x^1\_10) + y^1\_10= 0

S(x^1\_13) + y^1\_13= 0

S(x^2\_0) + y^2\_0= 0

S(x^2\_4) + y^2\_4= 0

S(x^2\_7) + y^2\_7= 0

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

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

S(x^3\_8) + y^3\_8= 0

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

the 7 th Minimal Constraint set is:

y^0\_1 + y^0\_11 + [y^0\_14] + [x^1\_1] + k1\_1 + k2\_1\_0 + k3\_1\_0= 0

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

[y^0\_5] + [y^0\_8] + x^1\_10 + k1\_5 + k2\_5\_0 + k3\_5\_0= 0

y^1\_0 + y^1\_10 + y^1\_13 + x^2\_0 + k1\_9 + k2\_9\_0 + k3\_9\_0= 0

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

y^1\_3 + x^2\_7 + 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\_6] + y^1\_9 + [x^2\_11] + k1\_12 + k2\_12\_0 + k3\_12\_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\_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^2\_7 + y^2\_10 + x^3\_8 + k1\_3 + k2\_3\_1 + k3\_3\_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\_6 + [y^3\_9] + [x^4\_11] + k1\_10 + k2\_10\_1 + k3\_10\_1= 0

S(x^1\_10) + y^1\_10= 0

S(x^1\_13) + y^1\_13= 0

S(x^2\_0) + y^2\_0= 0

S(x^2\_4) + y^2\_4= 0

S(x^2\_7) + y^2\_7= 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\_8) + y^3\_8= 0

the 8 th Minimal Constraint set is:

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

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

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

S(x^4\_8) + y^4\_8= 0

S(x^5\_2) + y^5\_2= 0

the 9 th Minimal Constraint set is:

[y^1\_1] + y^1\_11 + [y^1\_14] + x^2\_1 + 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^2\_1 + x^3\_5 + k1\_7 + k2\_7\_1 + k3\_7\_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^4\_1] + [y^4\_11] + y^4\_14 + x^5\_1 + k1\_3 + k2\_3\_2 + k3\_3\_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^4\_7] + y^4\_10 + [x^5\_8] + k1\_5 + k2\_5\_2 + k3\_5\_2= 0

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

S(x^2\_1) + y^2\_1= 0

S(x^3\_5) + y^3\_5= 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\_1) + y^5\_1= 0

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

the 10 th Minimal Constraint set is:

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

S(x^4\_0) + y^4\_0= 0

the 11 th Minimal Constraint set is:

y^0\_1 + y^0\_11 + [y^0\_14] + [x^1\_1] + k1\_1 + k2\_1\_0 + k3\_1\_0= 0

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

[y^0\_5] + [y^0\_8] + x^1\_10 + k1\_5 + k2\_5\_0 + k3\_5\_0= 0

y^1\_0 + y^1\_10 + y^1\_13 + x^2\_0 + k1\_9 + k2\_9\_0 + k3\_9\_0= 0

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

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

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

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

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^1\_10) + y^1\_10= 0

S(x^1\_13) + y^1\_13= 0

S(x^2\_0) + y^2\_0= 0

S(x^2\_4) + y^2\_4= 0

S(x^3\_4) + y^3\_4= 0

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

the 12 th Minimal Constraint set is:

[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^4\_8) + y^4\_8= 0

the 13 th Minimal Constraint set is:

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

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

S(x^4\_8) + y^4\_8= 0

the 14 th Minimal Constraint set is:

[y^0\_2] + [y^0\_8] + [y^0\_15] + x^1\_2 + k1\_2 + k2\_2\_0 + k3\_2\_0= 0

[y^0\_5] + [y^0\_8] + x^1\_10 + k1\_5 + k2\_5\_0 + k3\_5\_0= 0

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

y^1\_0 + y^1\_10 + x^2\_12 + k1\_9 + k2\_9\_0 + k3\_9\_0= 0

y^1\_2 + x^2\_6 + k1\_8 + k2\_8\_0 + k3\_8\_0= 0

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

y^2\_3 + [x^3\_7] + 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\_6 + y^2\_9 + x^3\_11 + k1\_4 + k2\_4\_1 + k3\_4\_1= 0

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

S(x^1\_2) + y^1\_2= 0

S(x^1\_10) + y^1\_10= 0

S(x^2\_4) + y^2\_4= 0

S(x^2\_6) + y^2\_6= 0

S(x^2\_12) + y^2\_12= 0

S(x^3\_11) + y^3\_11= 0

the 15 th Minimal Constraint set is:

[y^0\_5] + [y^0\_8] + x^1\_10 + k1\_5 + k2\_5\_0 + k3\_5\_0= 0

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

y^1\_0 + y^1\_10 + x^2\_12 + k1\_9 + k2\_9\_0 + k3\_9\_0= 0

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

y^2\_3 + y^2\_9 + [x^3\_15] + 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

S(x^1\_10) + y^1\_10= 0

S(x^2\_4) + y^2\_4= 0

S(x^2\_12) + y^2\_12= 0

the 16 th Minimal Constraint set is:

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

S(x^3\_12) + y^3\_12= 0

the 17 th Minimal Constraint set is:

[y^1\_1] + y^1\_11 + [y^1\_14] + x^2\_1 + 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^2\_1 + [y^2\_11] + [x^3\_13] + k1\_7 + k2\_7\_1 + k3\_7\_1= 0

S(x^2\_1) + y^2\_1= 0

the 18 th Minimal Constraint set is:

[y^0\_2] + [x^1\_6] + k1\_2 + k2\_2\_0 + k3\_2\_0= 0

the 19 th Minimal Constraint set is:

[y^0\_2] + [y^0\_8] + [x^1\_14] + k1\_2 + k2\_2\_0 + k3\_2\_0= 0

the 20 th Minimal Constraint set is:

[y^1\_1] + [x^2\_5] + k1\_15 + k2\_15\_0 + k3\_15\_0= 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^3\_0] + [y^3\_10] + [x^4\_12] + k1\_15 + k2\_15\_1 + k3\_15\_1= 0

the 23 th Minimal Constraint set is:

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

the 24 th Minimal Constraint set is:

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

the 25 th Minimal Constraint set is:

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

the 26 th Minimal Constraint set is:

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

the 27 th Minimal Constraint set is:

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

the 28 th Minimal Constraint set is:

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

the 29 th Minimal Constraint set is:

[y^5\_0] + [x^6\_4] + k1\_11 + k2\_11\_2 + k3\_11\_2= 0

the 30 th Minimal Constraint set is:

[y^6\_1] + [y^6\_11] + [x^7\_13] + k1\_5 + k2\_5\_3 + k3\_5\_3= 0