Examples (6,6,6)

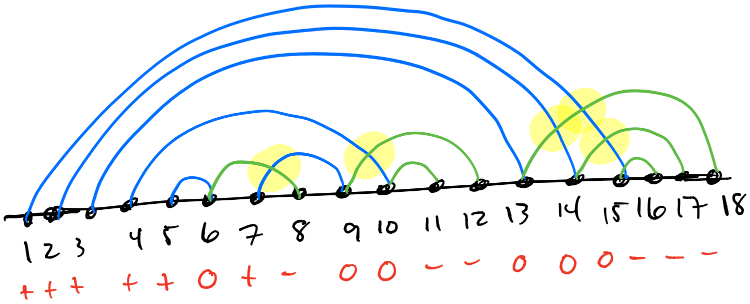
① (245)

1	2	3	4	5	7
6	9	10	13	14	15
8	11	12	16	17	18

$\supseteq$

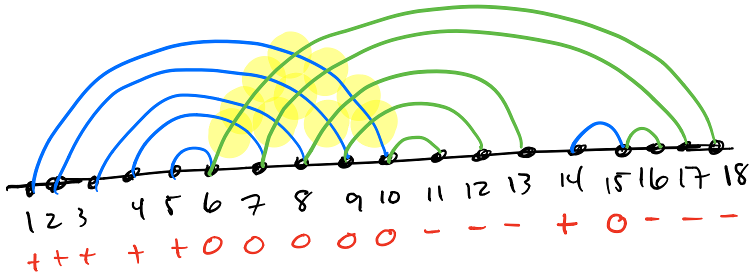
(437)

1	2	3	4	5	14
6	7	8	9	10	15
11	12	13	16	17	18



Cross: 5

rank: 33



Cross: 10

rank: 34

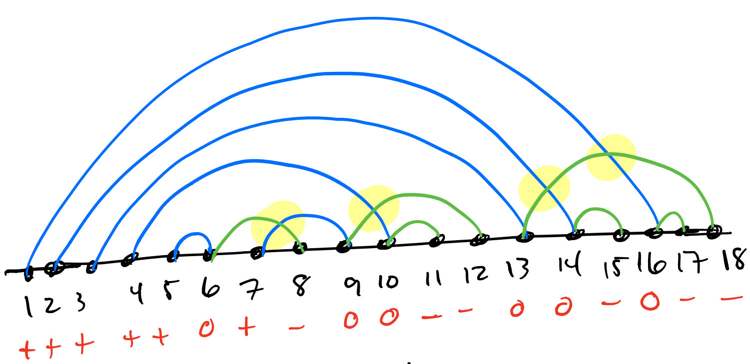
② (246)

1	2	3	4	5	7
6	9	10	13	14	16
8	11	12	15	17	18

$\supseteq$

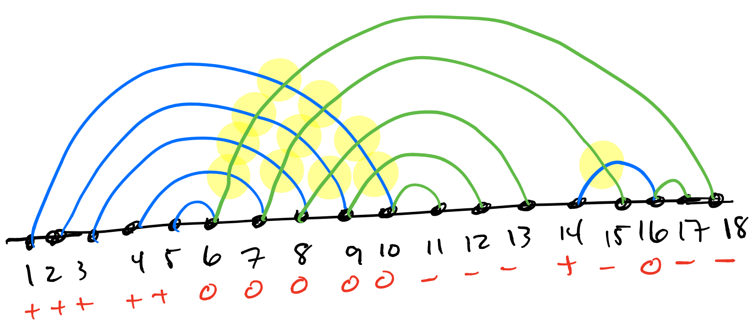
(438)

1	2	3	4	5	14
6	7	8	9	10	16
11	12	13	15	17	18



Cross: 4

rank: 32



cross: 11

rank: 33

③

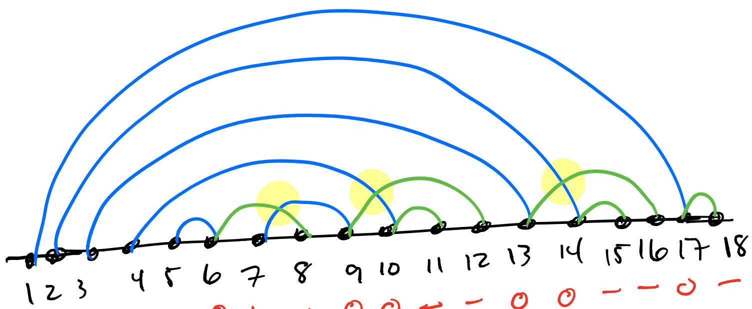
(247)

1	2	3	4	5	7
6	9	10	13	14	17
8	11	12	15	16	18

$\supseteq$

(439)

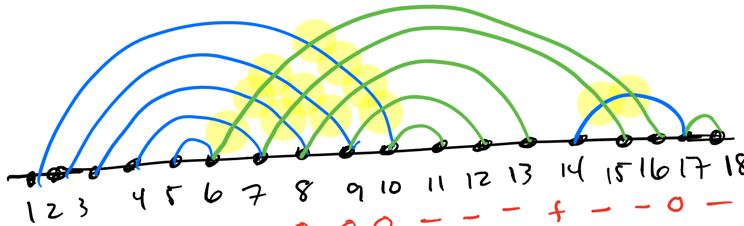
1	2	3	4	5	14
6	7	8	9	10	17
11	12	13	15	16	18



+ + + + + 0 + − 0 0 − − 0 0 − − 0 −

Cross: 3

rank: 31



+ + + + + 0 0 0 0 0 − − − + − − 0 −

Cross: 12

rank: 32

---

④

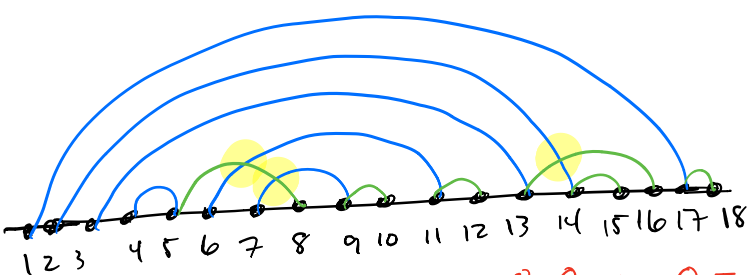
(1416)

1	2	3	4	6	7
5	9	11	13	14	17
8	10	12	15	16	18

$\supseteq$

(1623)

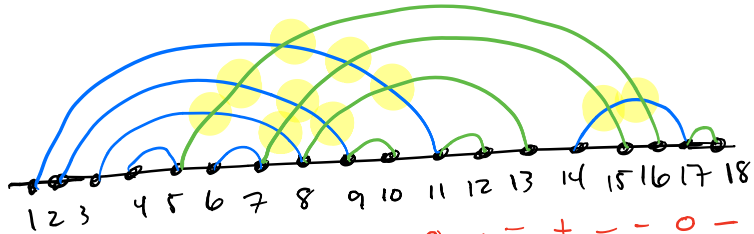
1	2	3	4	6	14
5	7	8	9	11	17
10	12	13	15	16	18



+ + + + 0 + + − 0 − 0 − 0 0 − − 0 −

Cross: 3

rank: 29



+ + + + 0 + 0 0 0 − 0 − − + − − 0 −

Cross: 10

rank: 30

(4)

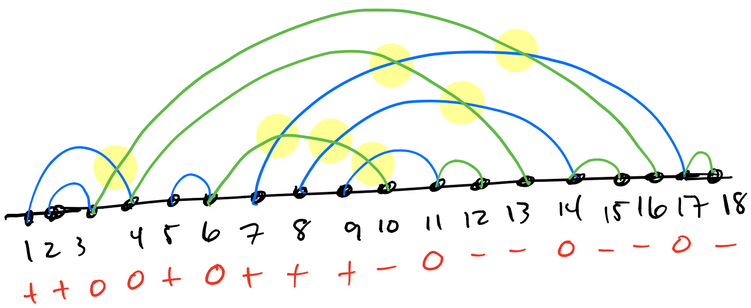
(39169)

1	2	5	7	8	9
3	4	6	11	14	17
10	12	13	15	16	18

$\supseteq$

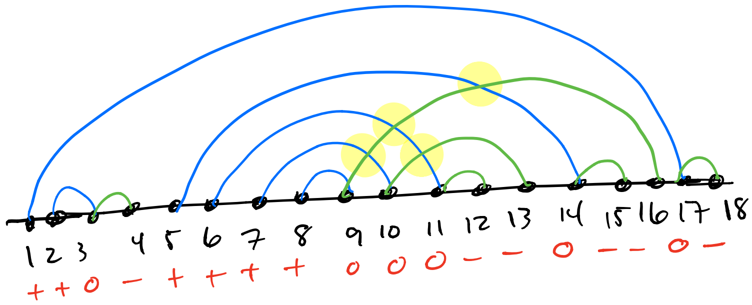
(45485)

1	2	5	6	7	8
3	9	10	11	14	17
4	12	13	15	16	18



Cross: 7

rank: 25



Cross: 4

rank: 26

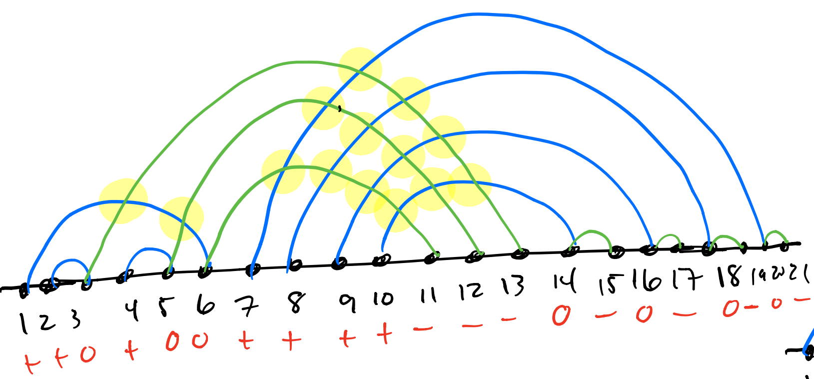
(501379)

1	2	4	7	8	9	10
3	5	6	14	16	18	20
11	12	13	15	17	19	21

$\supseteq$

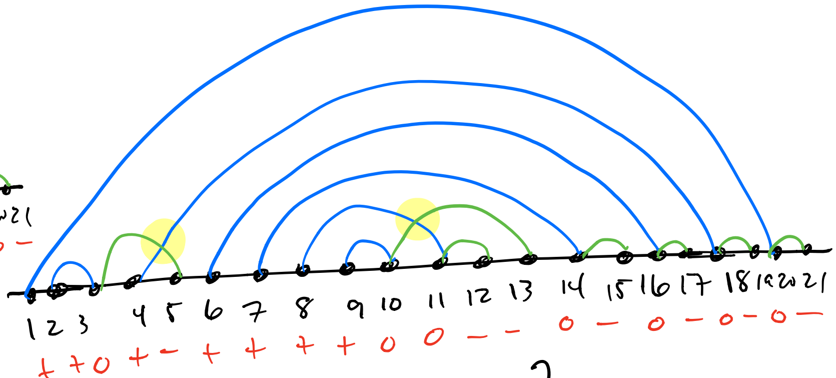
(556359)

1	2	4	6	7	8	9
3	10	11	14	16	18	20
5	12	13	15	17	19	21



Cross: 14

rank: 32



Cross: 2

rank: 34

1	2	5	7	8	9
3	4	6	11	14	17
10	12	13	15	16	18

$\supseteq$

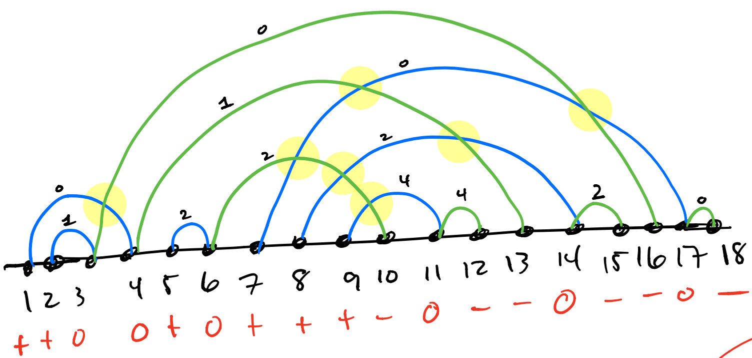
1	2	5	6	7	8
3	9	10	11	14	17
4	12	13	15	16	18

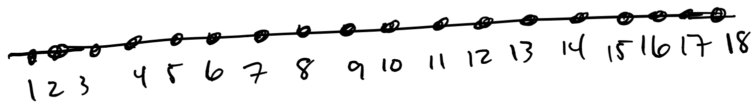
$S \supseteq S'$

$r(S) > r(S')$

$c(S) < c(S')$

M-Diagrams





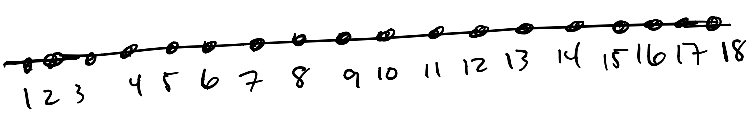
rank = nest # + # crossings.

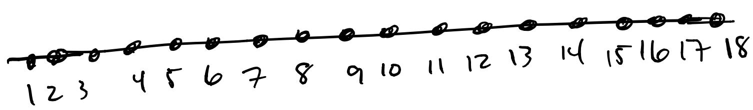
= 18 + 7 = 25

$S \supseteq S'$

$r(S) < r(S')$

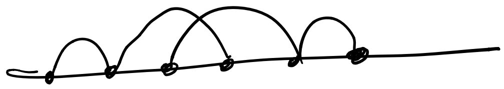
$c(S) > c(S')$



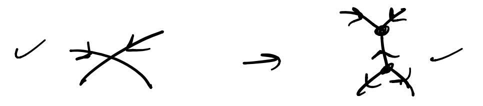


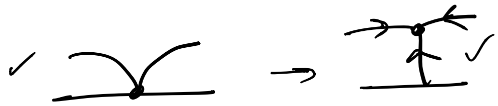
Webs.

1	3
2	5
4	6

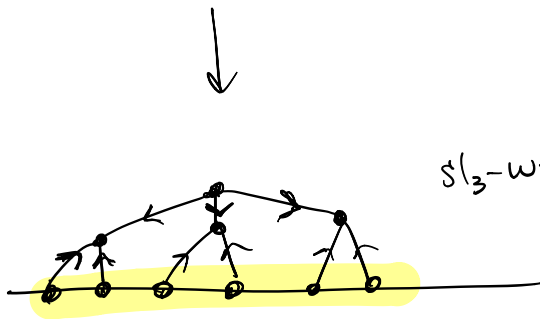


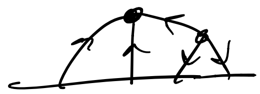
+ 0 + − 0 −





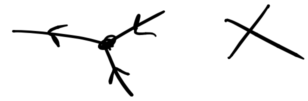
sl_3-web.





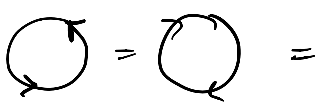
sl_3-web

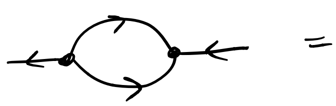
- trivalent graph w/ boundary.
- oriented
- every internal vertex is a source or sink.

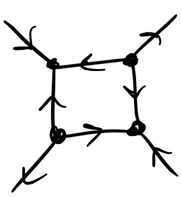
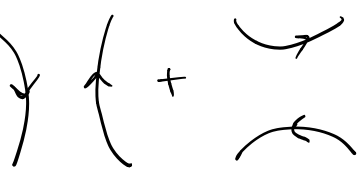


- Webs form a vector space (over $\mathbb{C}[q, q^{-1}]$).
- Relations on them (reduce to a basis).

Remove all circles, bigons, and squares.

 $= q^2 + 1 + q^{-2}$ ③

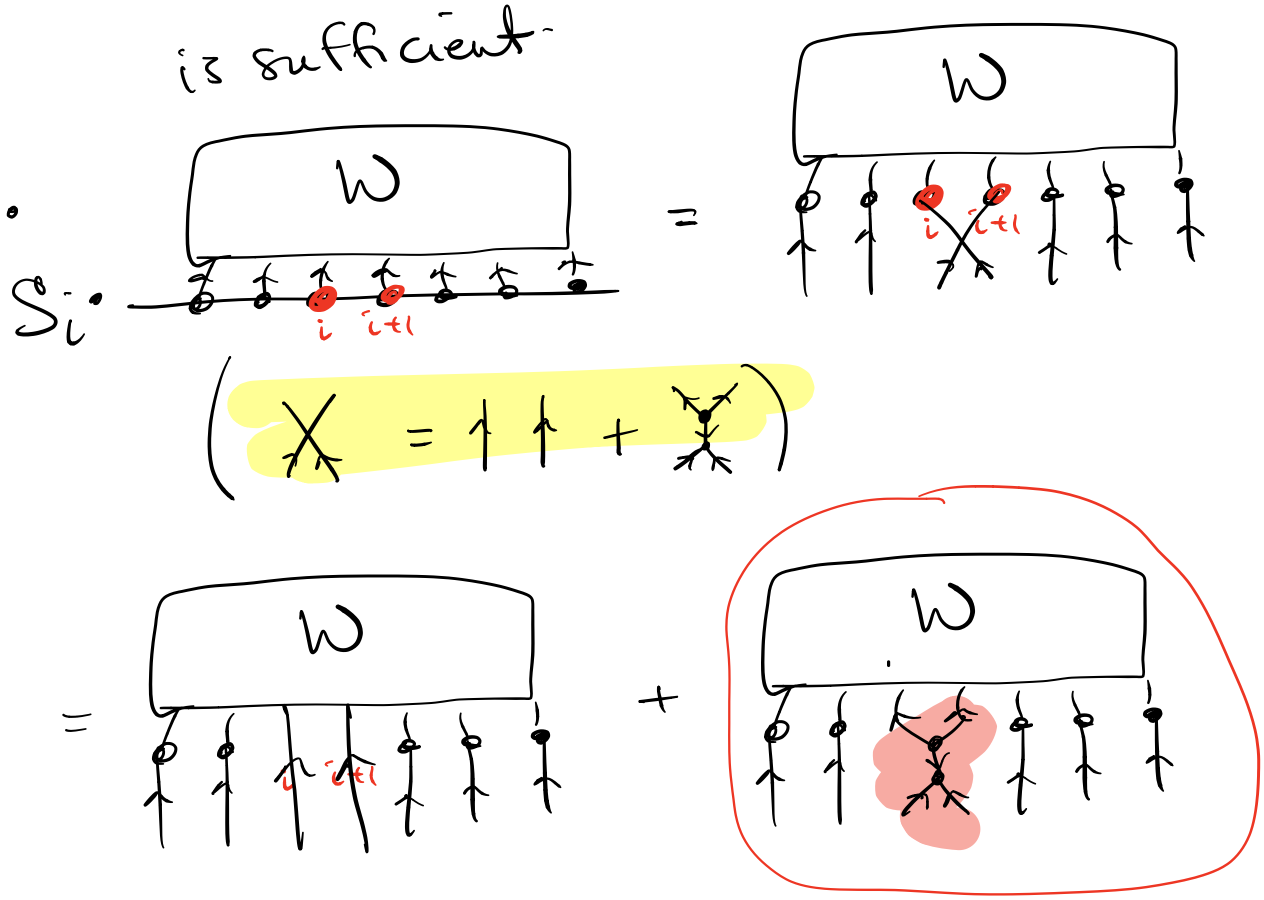
 $= -(q + q^{-1})$ ② 

 $=$ 

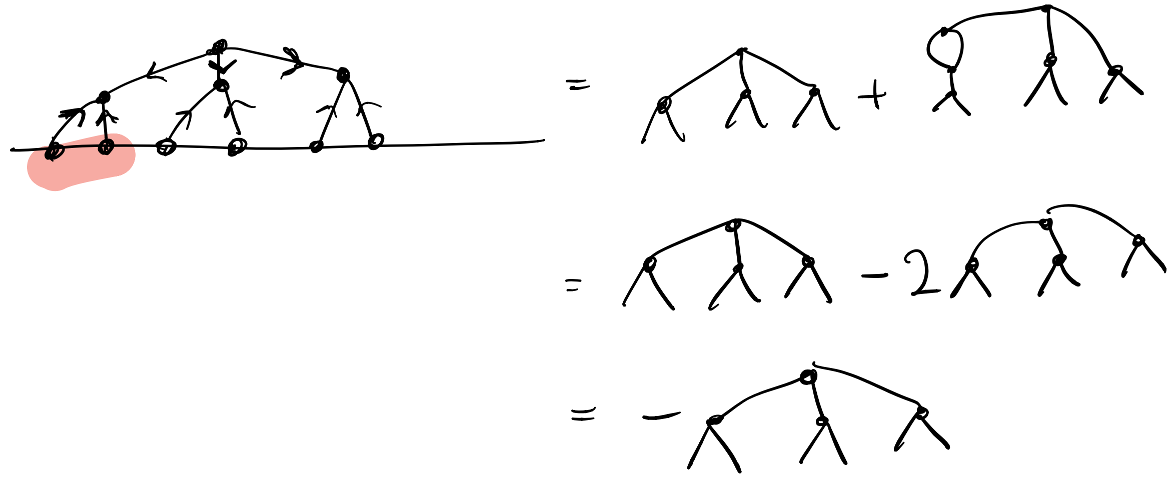
$q = 1$

· Basis of webs (reduced) - all webs w/ no circles, bigons, or squares. This basis is in bijection w/ std. tableaux.

· Symmetric group action on webs.
Recall that every permutation can be written as a product of simple transpositions. $s_i = (i, i+1)$. Specify how s_i act on webs and that is sufficient.



s_1:



s_2: