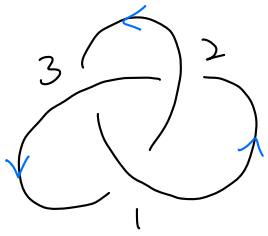
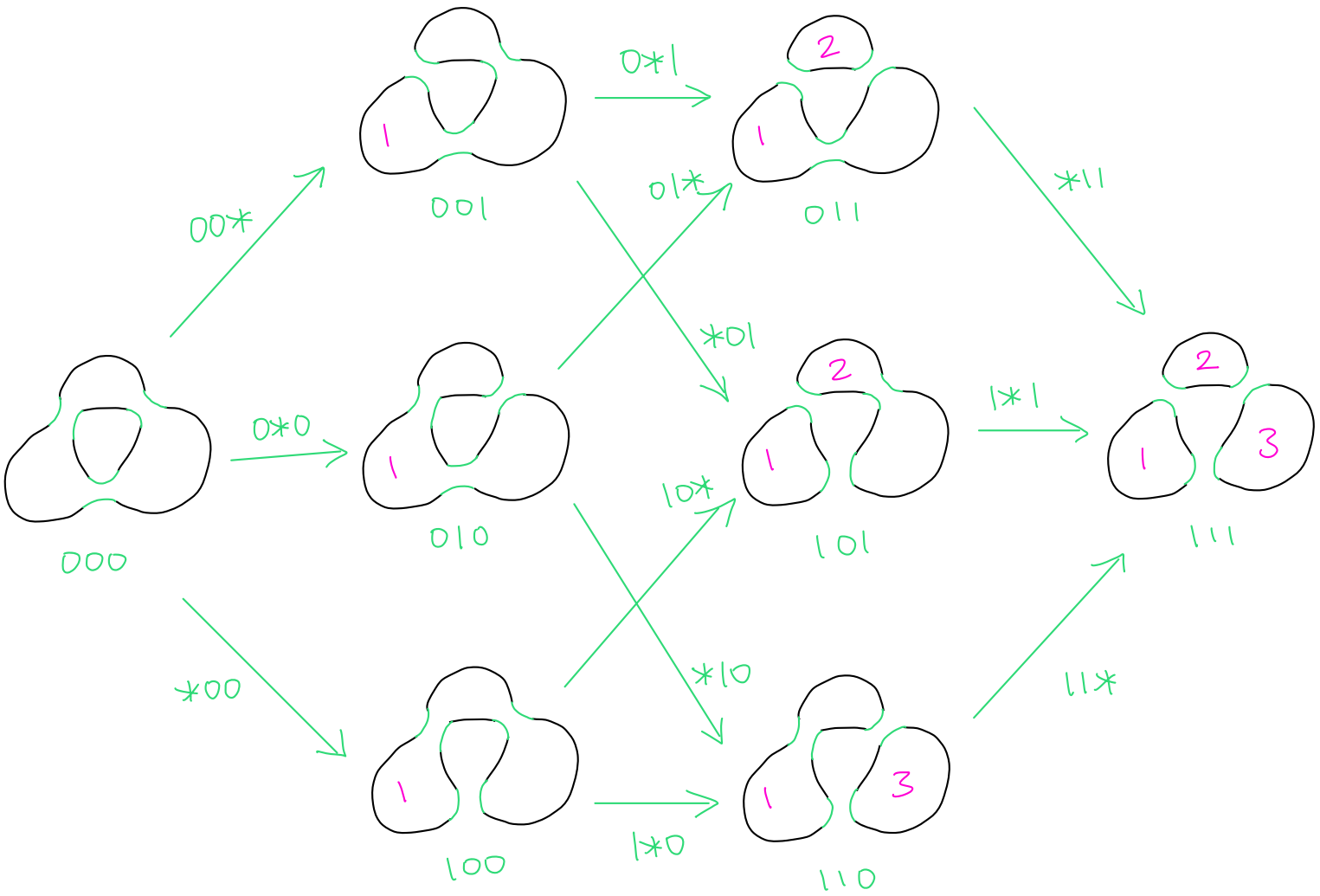
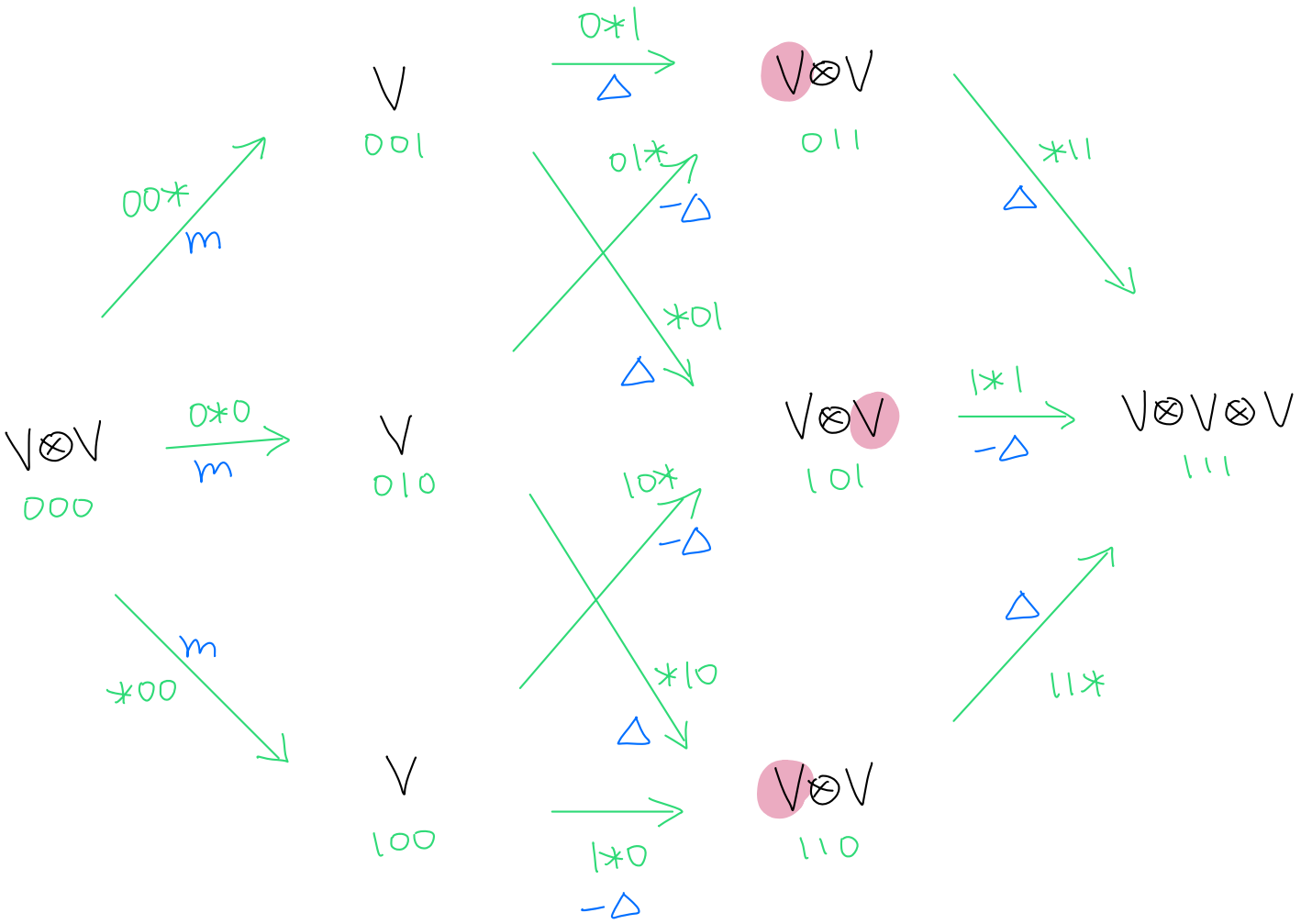


$n_+ = 3$

$n_- = 0$



(#circles) f_{BN}



$m : V \otimes V \to V$

$v_+ \otimes v_+ \mapsto v_+$

$v_+ \otimes v_- \mapsto v_-$

$v_- \otimes v_+ \mapsto v_-$

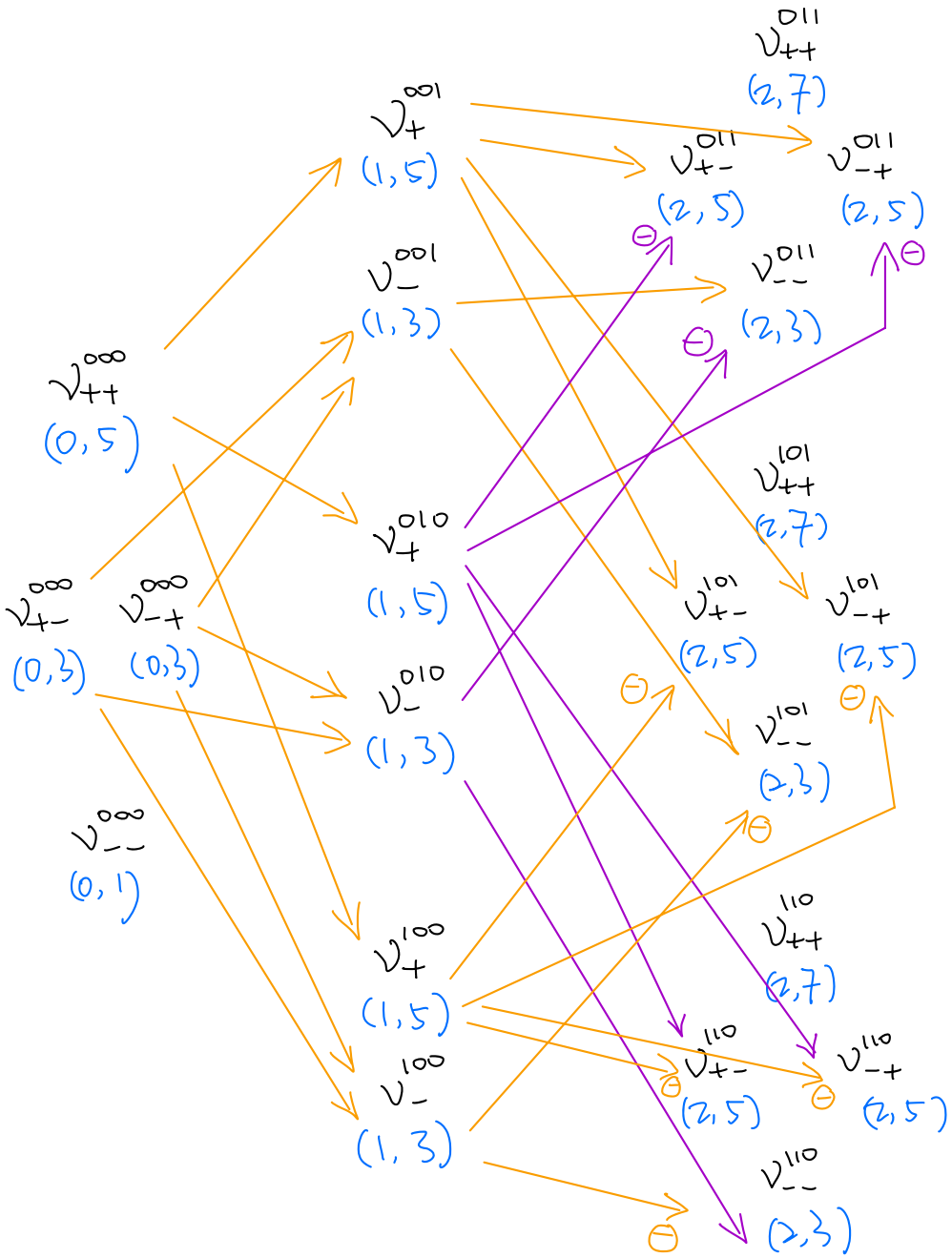
$v_- \otimes v_- \mapsto 0$

$\triangle : V \to V \otimes V$

$v_+ \mapsto v_+ \otimes v_- + v_- \otimes v_+$

$v_- \mapsto v_- \otimes v_-$

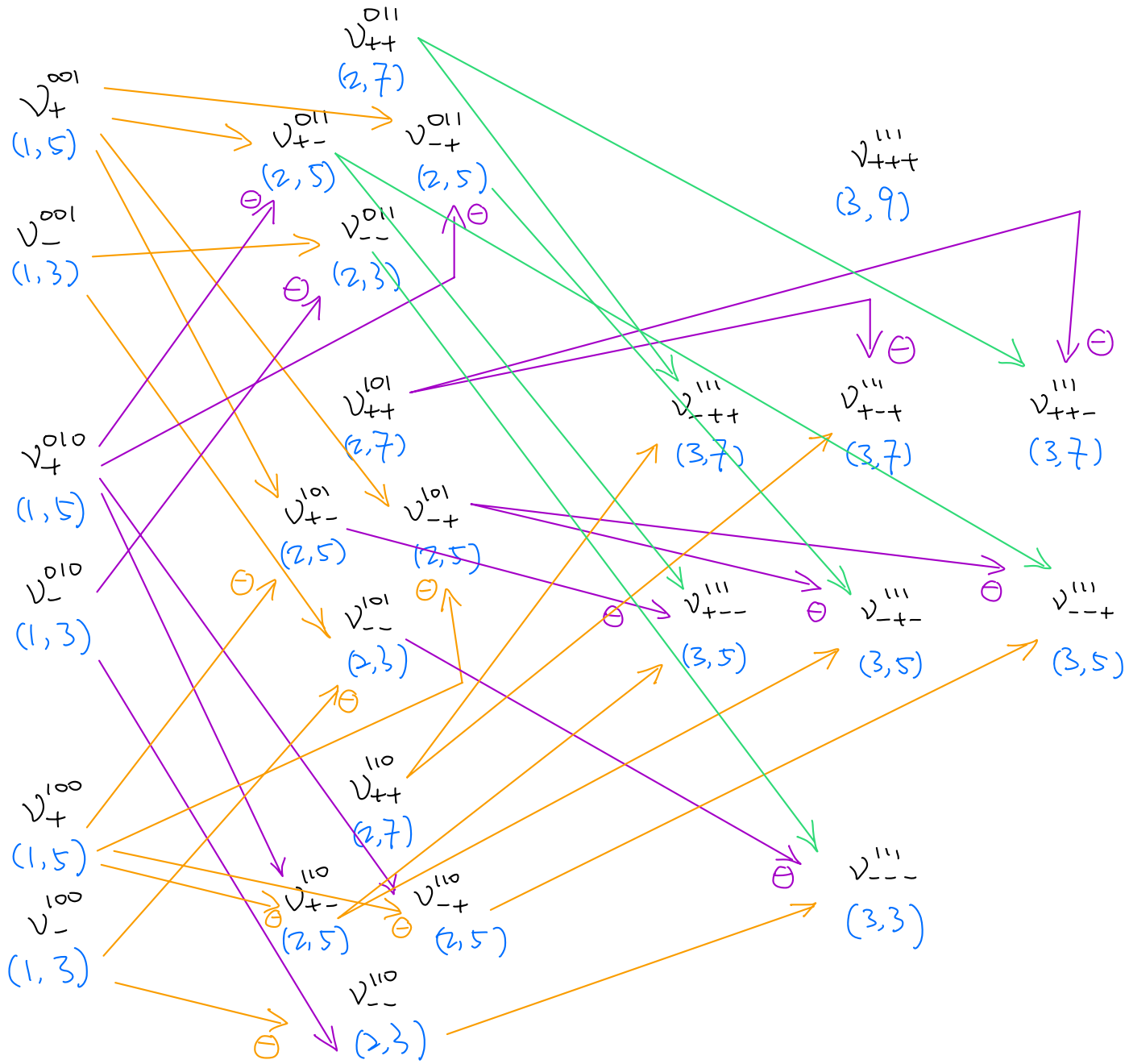
$$\begin{cases} h = \#\text{ of } 1\text{'s} - n_- \\ g = \#\text{ of "+" signs} - \#\text{ of "-" signs} + \#\text{ of } 1\text{'s} + n_+ - 2n_- \end{cases}$$

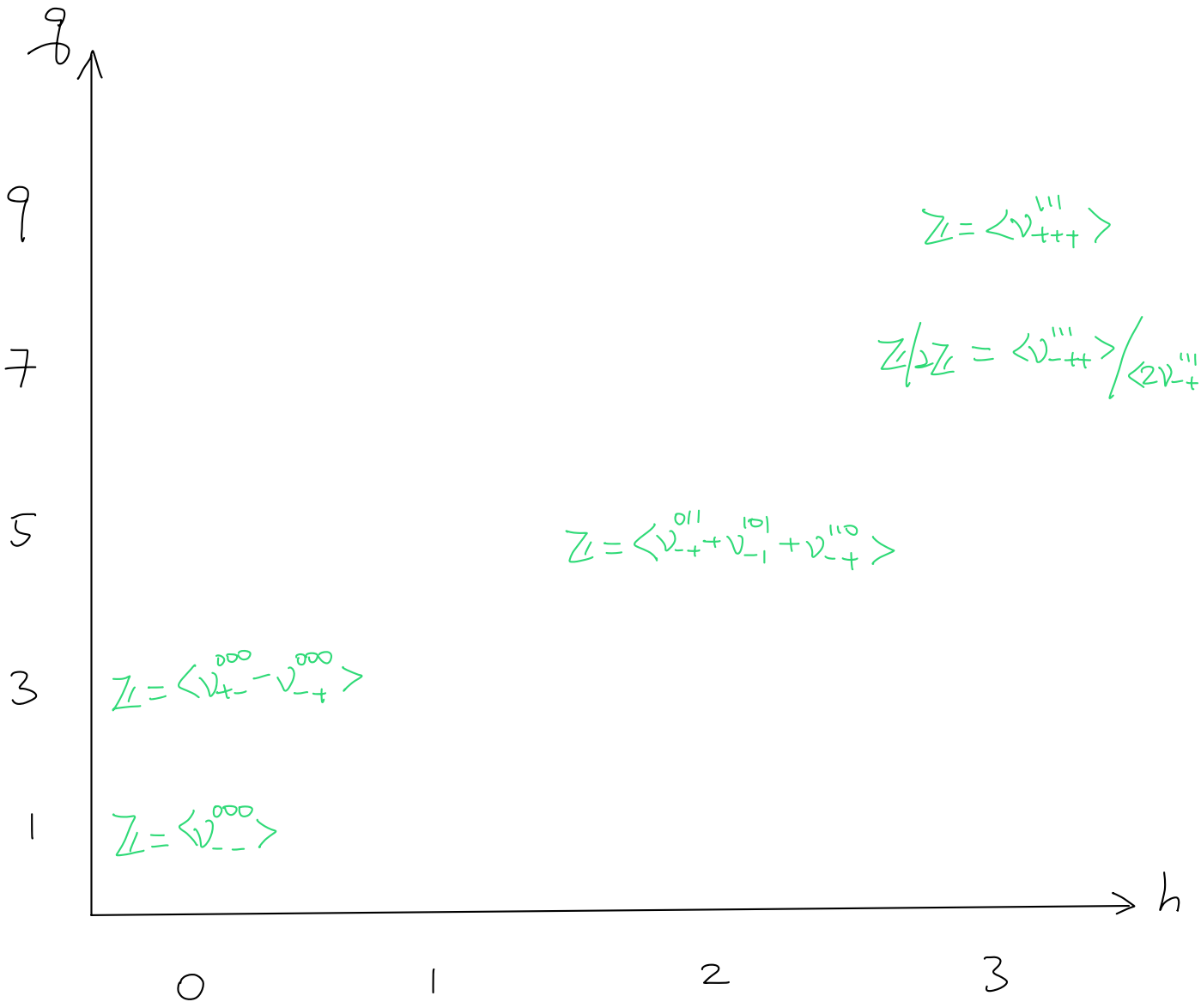


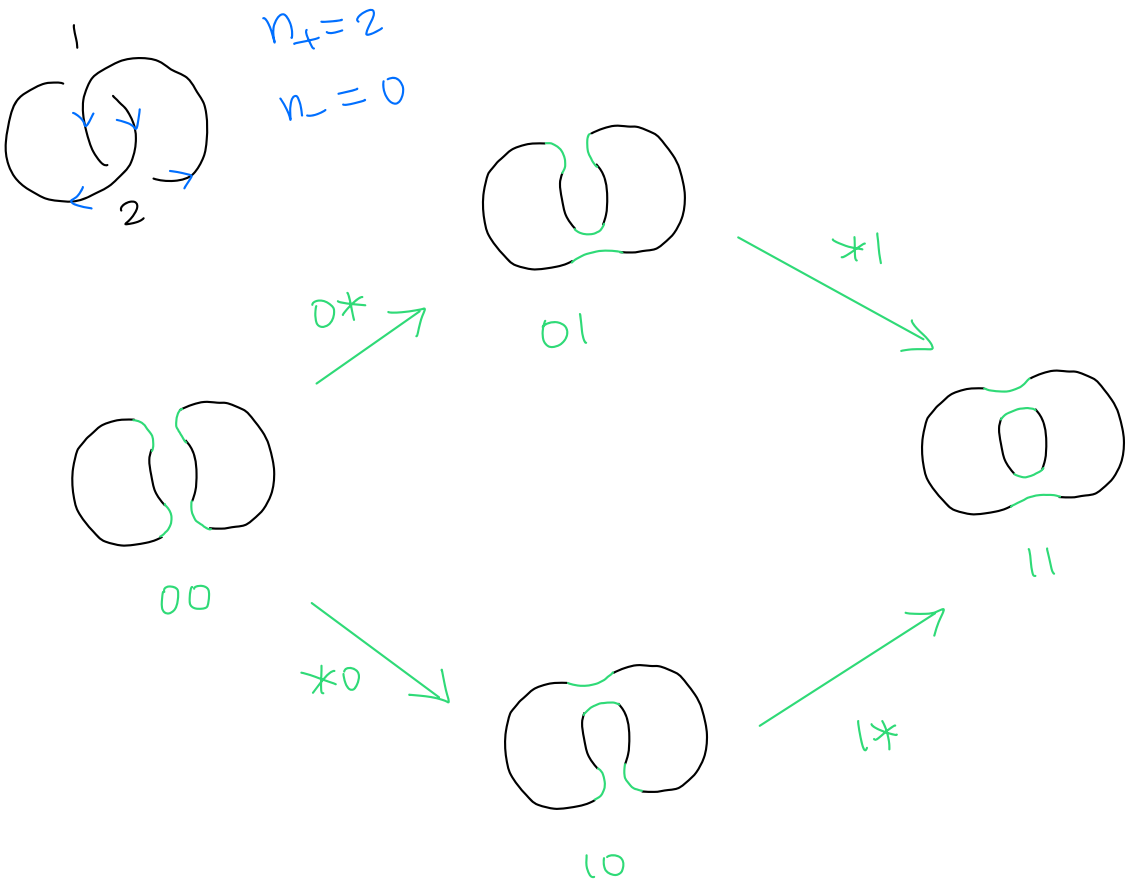
v_{+++}^{111} (3,9)

v_{-++}^{111} (3,7)	v_{+-+}^{111} (3,7)	v_{++-}^{111} (3,7)
v_{+--}^{111} (3,5)	v_{-+-}^{111} (3,5)	v_{--+}^{111} (3,5)
	v_{---}^{111} (3,3)	

(cont'd)


v_+^{001} (1,5)
v_-^{001} (1,3)
v_+^{010} (1,5)
v_-^{010} (1,3)
v_+^{100} (1,5)
v_-^{100} (1,3)
v_{++}^{011} (2,7)
v_{+-}^{011} (2,5)
v_{-+}^{011} (2,5)
v_{--}^{011} (2,3)
v_{++}^{101} (2,7)
v_{+-}^{101} (2,5)
v_{-+}^{101} (2,5)
v_{--}^{101} (2,3)
v_{++}^{110} (2,7)
v_{+-}^{110} (2,5)
v_{-+}^{110} (2,5)
v_{--}^{110} (2,3)
v_{+++}^{111} (3,9)
v_{-++}^{111} (3,7)
v_{+-+}^{111} (3,7)
v_{++-}^{111} (3,7)
v_{+--}^{111} (3,5)
v_{-+-}^{111} (3,5)
v_{--+}^{111} (3,5)
v_{---}^{111} (3,3)
Θ


g
9
7
5
3
1
h
0
1
2
3
$Z_{II} = \langle v^{111}_{+++} \rangle$
$Z_{II}/2Z_{II} = \langle v^{111}_{-++} \rangle / \langle 2v^{111}_{-++} \rangle$
$Z_{II} = \langle v^{011}_{-+} + v^{101}_{-1} + v^{110}_{-+} \rangle$
$Z_{II} = \langle v^{000}_{+-} - v^{000}_{-+} \rangle$
$Z_{II} = \langle v^{000}_{--} \rangle$



f_{BN}

$m(v_{++}^{00}) = v_+^{01}$

$m(v_{+-}^{00}) = m(v_{-+}^{00}) = v_-^{01}$

$m(v_{--}^{00}) = 0$

$\Delta(v_+^{01}) = v_{+-}^{11} + v_{-+}^{11}$

$\Delta(v_-^{01}) = v_{--}^{11}$

$V \otimes V$

v_{++}^{00}

v_{+-}^{00}, v_{-+}^{00}

v_{--}^{00}

m

V

v_+^{01}

v_-^{01}

Δ

$V \otimes V$

v_{++}^{11}

v_{+-}^{11}, v_{-+}^{11}

v_{--}^{11}

m

$-\Delta$

V

v_+^{10}

v_-^{10}

$m(v_{++}^{00}) = v_+^{10}$

$m(v_{+-}^{00}) = m(v_{-+}^{00}) = v_-^{10}$

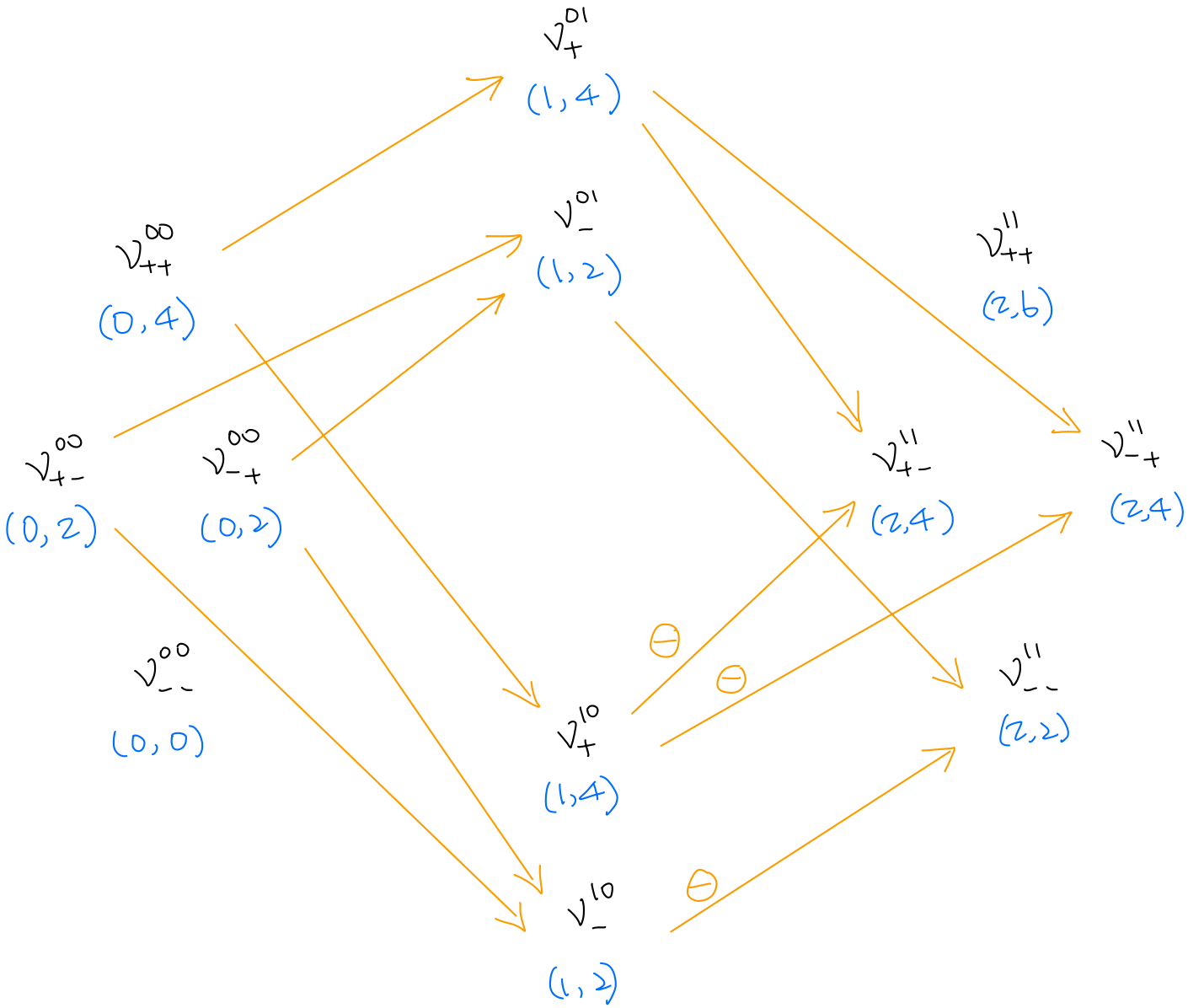
$m(v_{--}^{00}) = 0$

$-\Delta(v_+^{10}) = -(v_{+-}^{11} + v_{-+}^{11})$

$-\Delta(v_-^{10}) = -v_{--}^{11}$

h = # of 1's $- n_-$

g = # of "+" signs $-$ # of "$-$" signs $+$ # of 1's $+ n_+ - 2n_-$



$$\partial(v_{++}^{00}) = v_+^{01} + v_+^{10}$$

$$\partial(v_{+-}^{00}) = v_-^{01} + v_-^{10}$$

$$\partial(v_{-+}^{00}) = v_-^{01} + v_-^{10}$$

$$\partial(v_{--}^{00}) = 0$$

$$\partial(v_+^{01}) = v_{+-}^{11} + v_{-+}^{11}$$

$$\partial(v_-^{01}) = v_{--}^{11}$$

$$\partial(v_+^{10}) = -(v_{+-}^{11} + v_{-+}^{11})$$

$$\partial(v_-^{10}) = -v_{--}^{11}$$

$$\left(\frac{\langle \nu''_{+-}, \nu''_{-+} \rangle}{\langle \nu''_{+-} + \nu''_{-+} \rangle} \right)$$