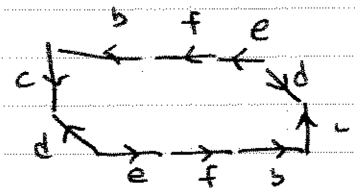
Math 5520 Winter 2010 37 possible

Homework #11 §21 #1,3,4,5

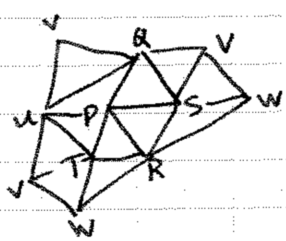
In 3j: add QVW. In 4, do only surfaces in 1 & 3.

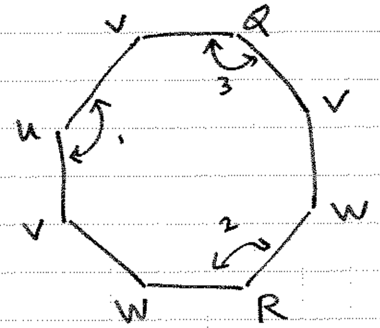
① Eliminate $\xrightarrow{a}\bullet\xleftarrow{a}$ to get



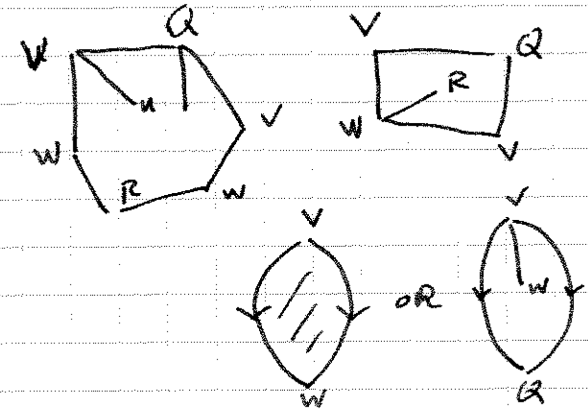
3

③ PQS, PRS, TUV, TVW, PRT, PTU,
(h) PQU, QUV, QSV, SVW, RSW, RTW



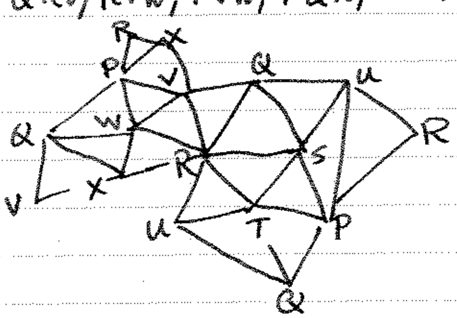


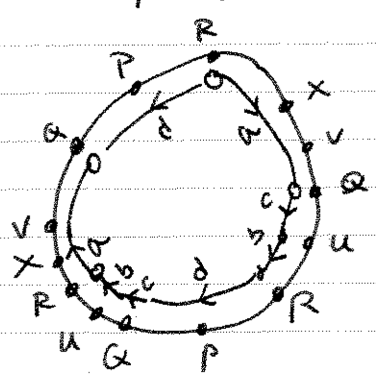
adjacent toroidal pairs



3

(i) QRS, RST, PST, PQT, RTU, QTU, QSU, PSU, PRU
QRV, RVW, PVW, PQW, RWX, QWX, QVX, PVX, PRX





a = RXVQ
b = UR
c = QU
d = RPQ

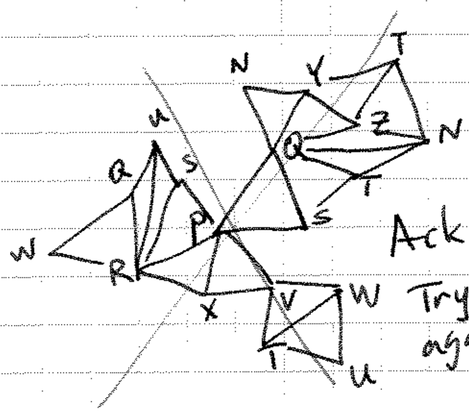
No toroidal pairs are adjacent in this version

3

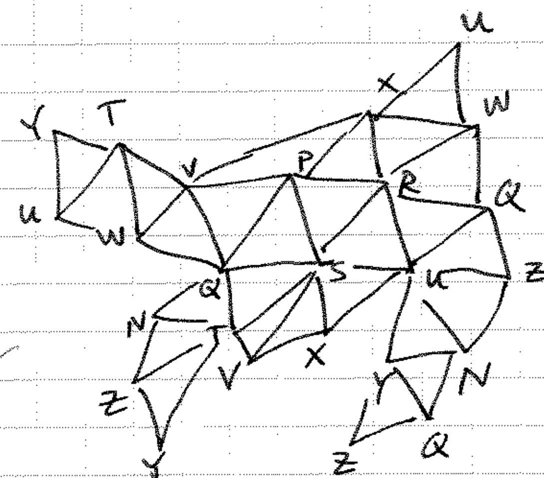
(j) PQS, NQY, QYZ, PRX, QRW, PVX, TVW, TUW, TYZ, NTZ,
QST, PRS, RSU, QRU, NQT, TUY, QUZ, PQV, RWX, UWX
NUZ, NUY, SUX, SVX, STV, QVW

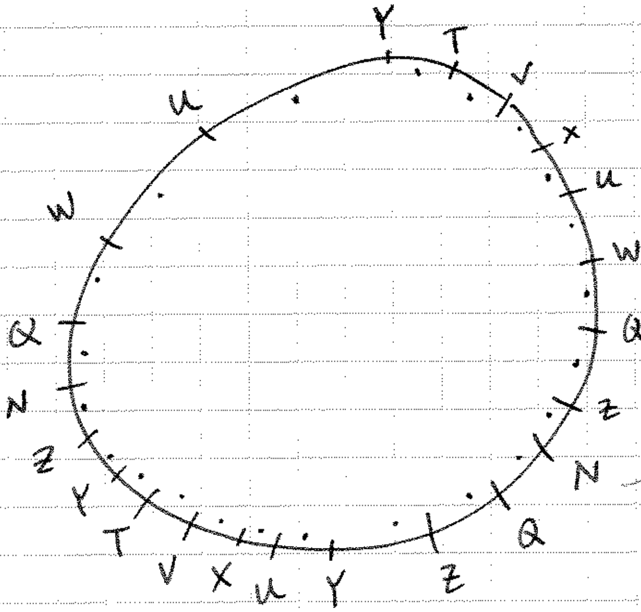
3

(j) cont.

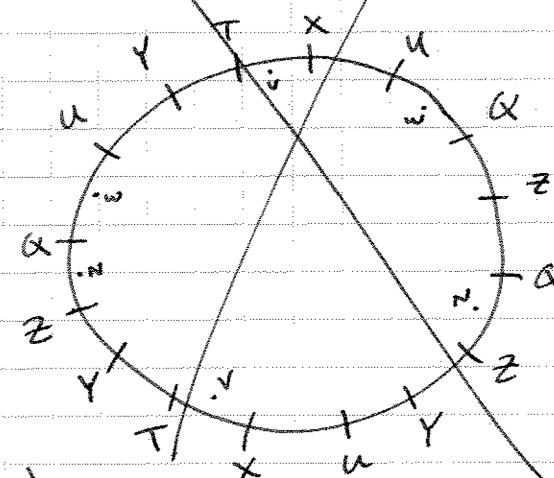


Ack! Try again.

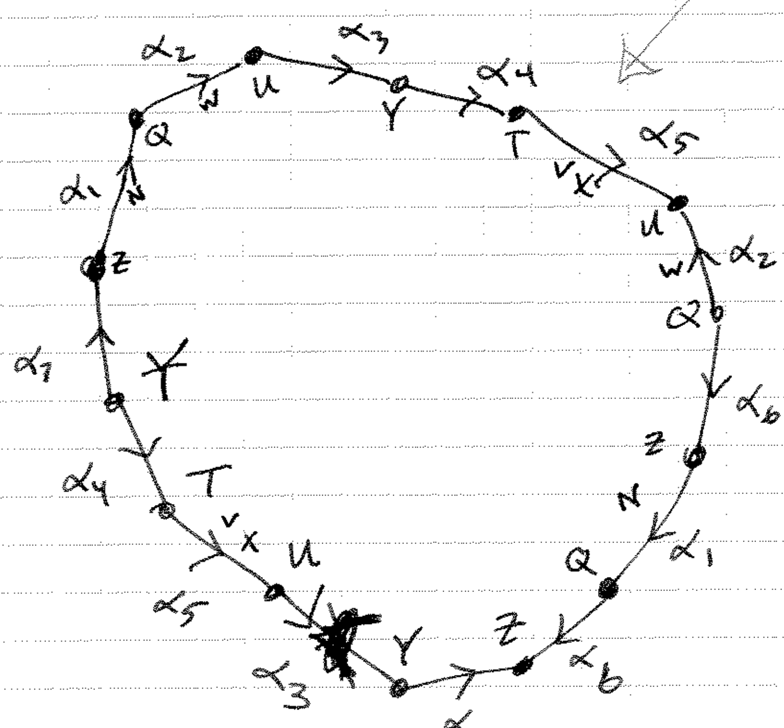




Simplify. $QWU \rightsquigarrow QU$
$TVX \rightsquigarrow TX$
$QNZ \rightsquigarrow QZ$

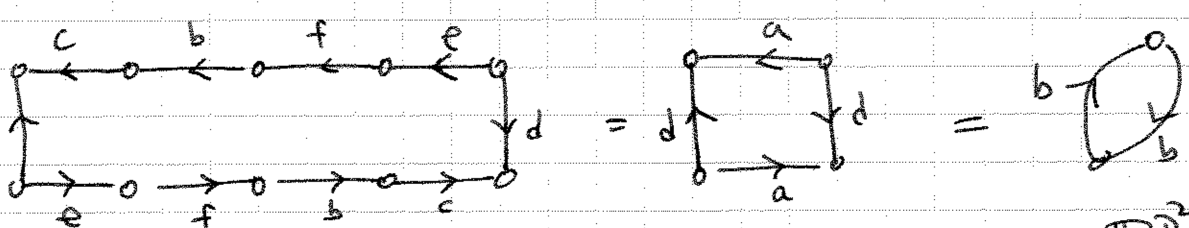


No toroidal pairs in this version.
Simplifying composite edges (e.g. $\alpha_1 = ZNQ$)



⊕

$\boxed{\#1}$

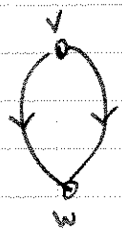


$= \mathbb{R}P^2$

$cbfe = a \longrightarrow da^{-1} = b$

5

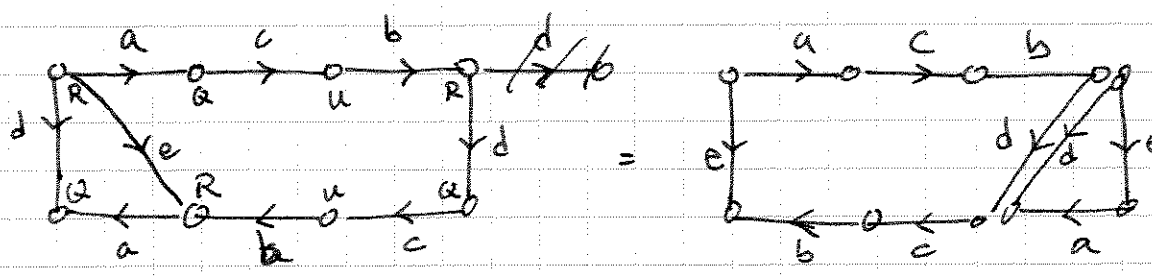
$\boxed{3h}$



$= S^2$

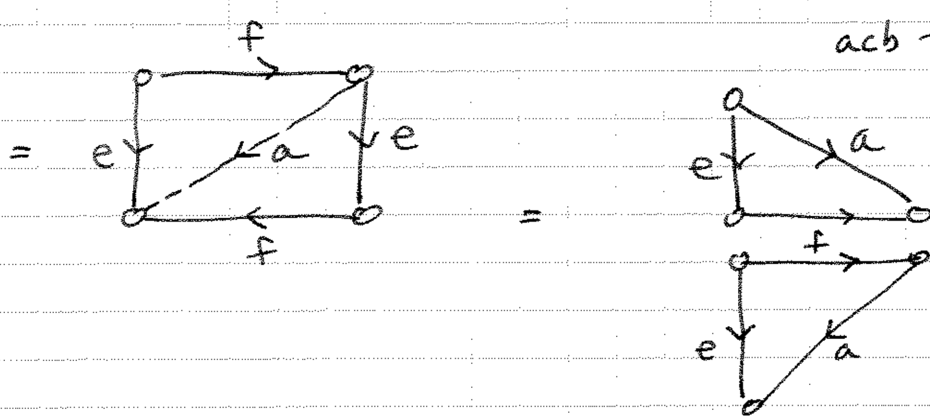
5

$\boxed{3i}$



$acb \rightsquigarrow f$

5



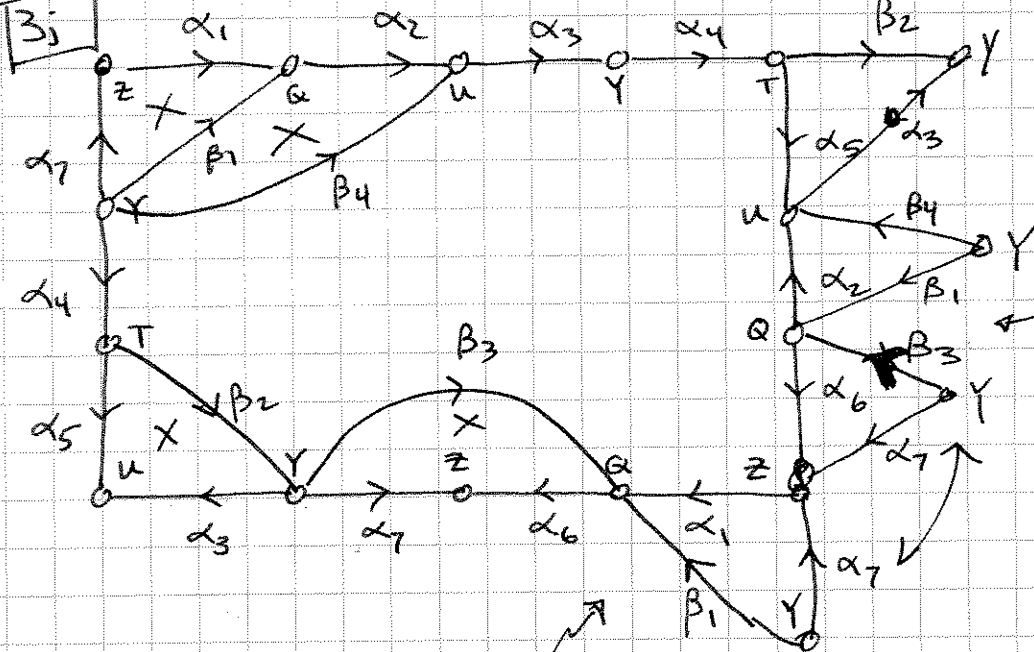
$=$ Klein bottle

5 $\boxed{3j}$ See Next Page.

(5) $T \# K = T \# P \# P = K \# P \# P = P^{\#4} = K \# K$

5 The connected sum of a torus & a Klein bottle, and the connected sum of two Klein bottles, are both $P^{\#4}$.

$\boxed{3j}$



$\gamma_1 = \beta_1 \beta_3^{-1}$

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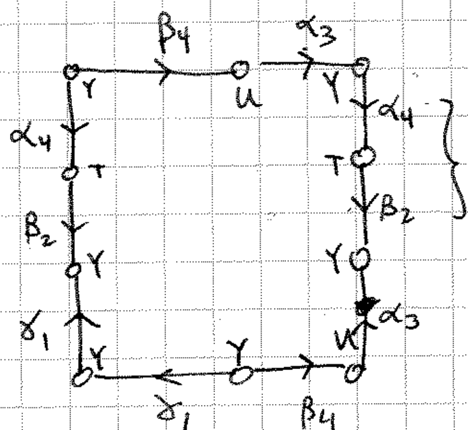
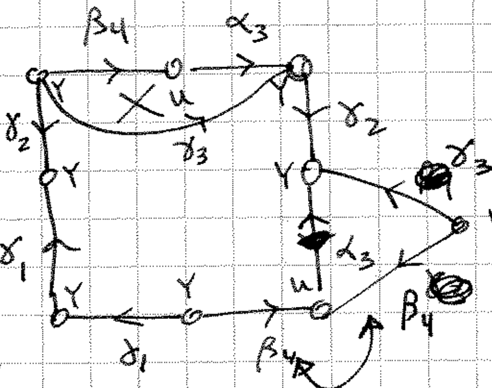
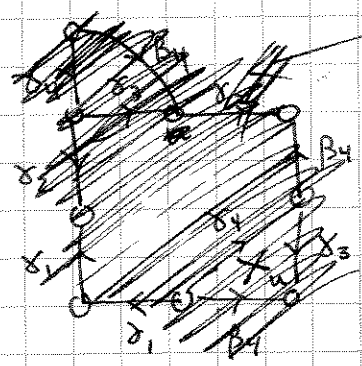
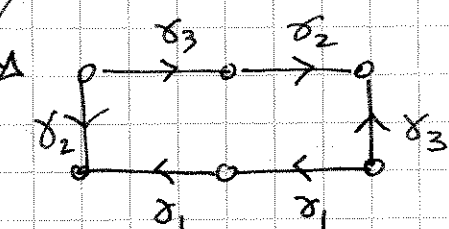


$\gamma_2 = \alpha_4 \beta_2$







Step 6

$\gamma_1 \gamma_1 \gamma_2 \gamma_2 \gamma_3 \gamma_3$

$P^{\#3}$