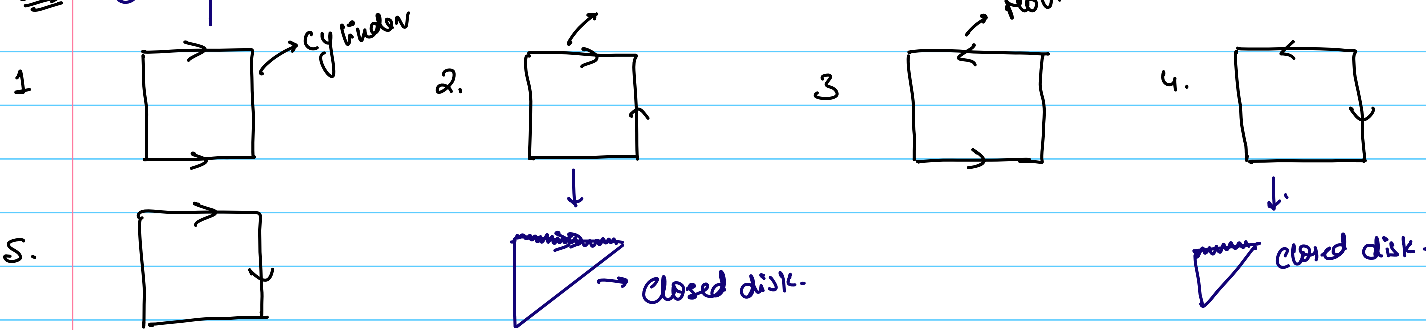
HOMEWORK -2

Ans1 One pair.

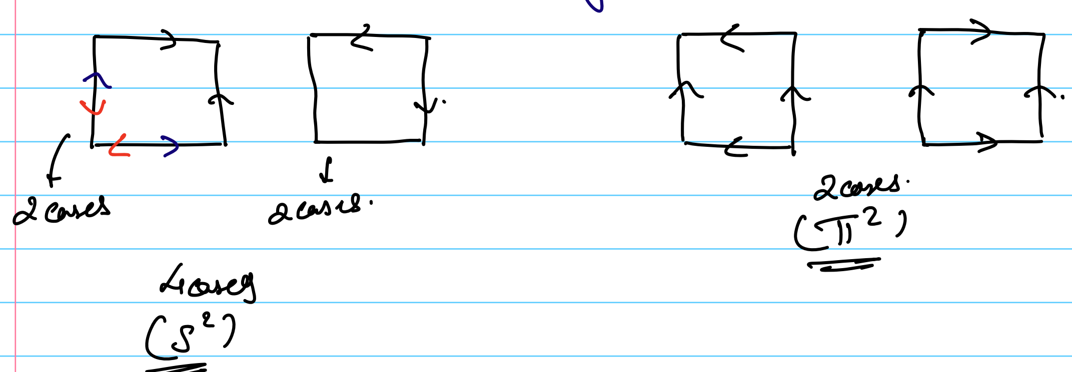


↳ not sure but online source says Möbius strip.

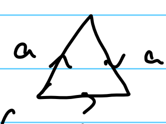
Two pair.

for all possibilities $\frac{{}^4C_2}{2} \times 2^4 \times \frac{1}{2} = 24$ possible.

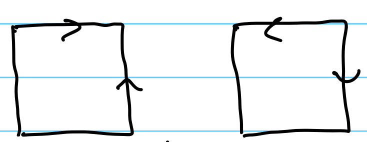
pairings CW·ACW for each edge. repeated / rotated.



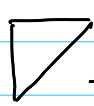
Both rotated ($\mathbb{RP}^2$)



↳ $\mathbb{RP}^2$ now we know.



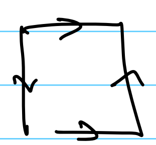
produces two.



→ all of these +

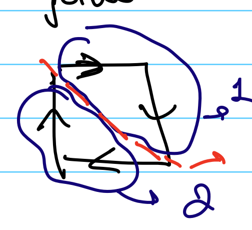
One rotated one not ($\mathbb{K}^2$)

So the parallel edges are easy case all

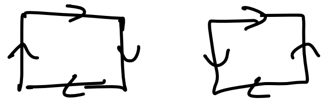


+ adjacent & möbius strip joined

⇒ all



along this boundary!!



Qn2) 1st one is not a triangulation of a T^2 as visually you can see that the point S does not have enough dimensions

 → all these point are converging at the center making it flat 

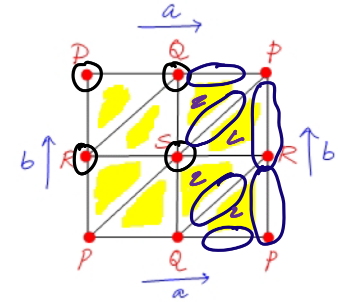
as all edges are part of at max 2 triangles it is a manifold.

$\chi = 4 - 6 + 4 = 2$

↓ points ↓ edges ↓ face

also we know $\chi(T^2) = 0$

This is enough to prove not homeomorphic.



2nd.

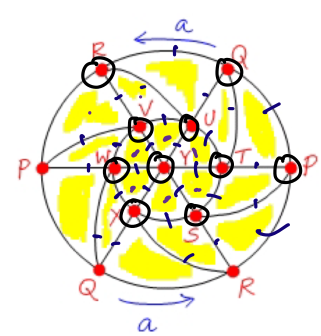
$\chi = 10 - 27 + 18 = 1$

$\chi(\mathbb{R}P^2) = 1$

but this is not enough we need to check orientability.

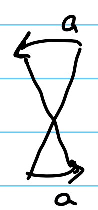
$12 \times 3 = 12 \times 2 = 24$

$6 \times 12 = 18$



χ + orientability → Complete invariant

We need to find a möbius strip which can be seen in the marked

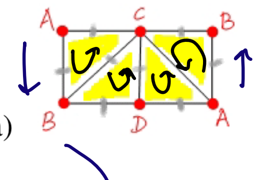


⇒ non oriantable

⇒ $\chi = 1$ + non oriantable ⇒ $\mathbb{R}P^2$

★ Sanity check each edge 2 triangles.

Qn3)

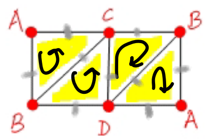


(a)

$\chi = 4 - 6 + 3 = 1$

Non oriantable.

möbius strip.

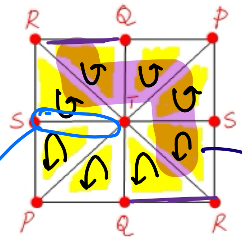


(b)

$\chi = 4 - 6 + 3 = 1.$

this is oriantable.

hence its a. ___ ?



(c)

Non orientable

$\chi = 5 - 8 + 4 = 1.$

this is non oriantable

hence $\mathbb{R}P^2$

Möbius strip.??