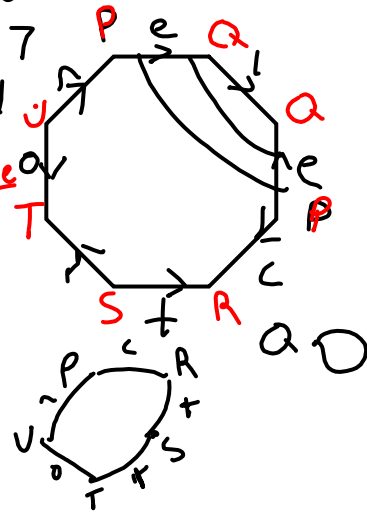


electron  
 $\chi(S) = V - E + F$   
 $6 - 7 + 1 = 0$

$V=6$   
 $E=7$   
 $F=1$

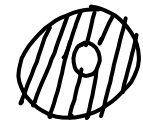
Orientable



$\chi(S) = 2 - 2g - b$   
 $2g = 2 - b - \chi(S)$   
 $2g = 2 - 2 - 0$   
 $\frac{2g}{2} = \frac{0}{2}$        $g = 0$

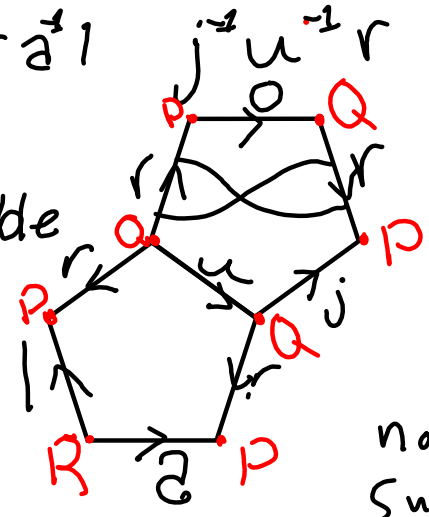
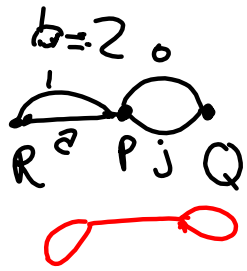
An orientable surface of genus 0 with 2 boundary components

Annulus



$r^2 u r a^1$

non-orientable



$V=3$   
 $E=6$   
 $F=2$

$\chi(S) = 3 - b + 2g$

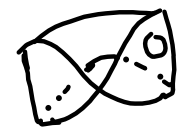
non-orientable surface with genus 1 and 2 boundary components.

$\chi(S) = 2 - g - b$

$g = 2 - b - \chi(S) = 2 - 2 - (-1)$

$g = 1$

Möbius band with one hole



o o m a n m a d e m a n g o e s

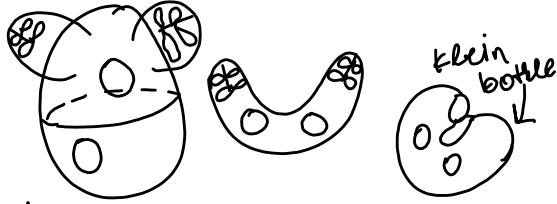
nonorientable  $\chi(s) = 2 - g - b$

$\chi(s) = 2 - g - b$   
 $-2 = 2 - g - 2$   
 $-2 = -g$   
 $g = 2$

nonorientable surface w/ 2 boundary components and 2 crosscaps

$\chi(s) = v - e + f$   
 $v = 4$   
 $e = 9$   
 $f = 3$   
 $4 - 9 + 3 = -2$

Klein Bottle w/ 2 boundary components



o r i g a m i crane

$\chi(s) = V - E + F$   
 $V = 6 = 6 - 9 + 2$   
 $E = 9$   
 $F = 2$   
 $\chi(s) = -1$

Boundary Components:

