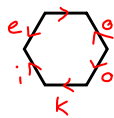


cookie cake

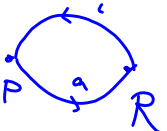
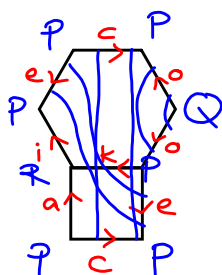


orientable
 $\chi = 2 - 2g - b$
 2 faces
 6 edges
 3 vertices

$$-1 = 2 - 2g - 1$$

$$-2 = -2g$$

$$1 = g$$



Euler characteristic:
 $\chi(s) = v - e + f$
 $= 3 - 6 + 2$
 $\chi = -1$

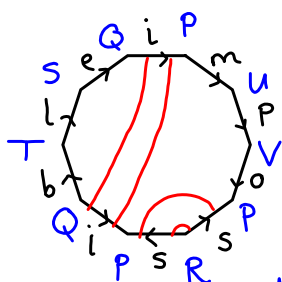
1 boundary component

orientable surface of genus 1 w/ 1 boundary component
 sphere w/ 1 handle & 1 hole

torus w/ a hole



IMPOSSIBLE



$$\chi = 2 - 2g - b$$

$$0 = 2 - 2g - 2$$

$$0 = -2g$$

$$0 = g$$

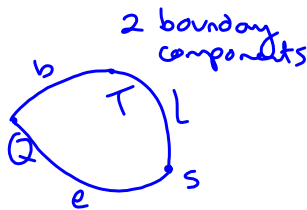
orientable: $\chi = 2 - 2g - b$

1 face
 8 edges
 7 vertices

$$\chi(s) = v - e + f$$

$$= 7 - 8 + 1$$

$$\chi(s) = 0$$



2 boundary components

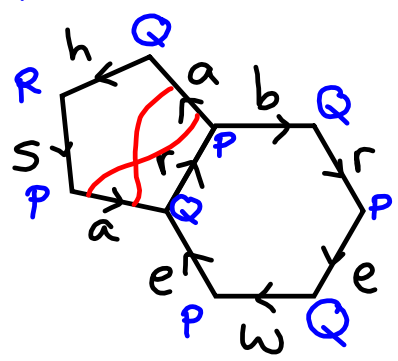
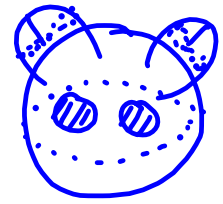
orientable surface of genus 0 w/ 2 boundary components

sphere w/ 2 holes

cylinder
 annulus



sarah brewer



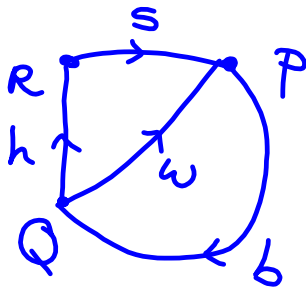
non-orientable
 $\chi = 2 - g - b$

vertices: 3
 edges: 7
 faces: 2

$$\chi = v - e + f$$

$$\Rightarrow = 3 - 7 + 2$$

$$\chi = -2$$



2 boundary components

$$\chi = 2 - g - b$$

$$-2 = 2 - g - 2$$

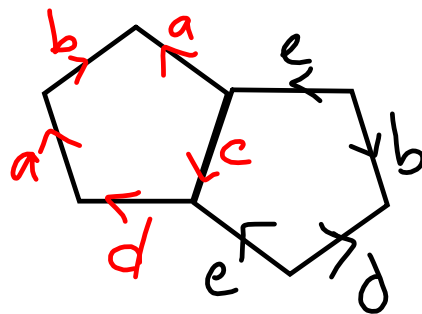
$$-2 = -g$$

$$2 = g$$

non-orientable
 surface of genus 2
 w/ 2 boundary components
 sphere w/ 2 crosscaps
 & 2 holes
 Klein bottle w/ 2 holes

$ab\bar{a}cd$

$b^{-1}e\bar{c}e^{-1}d$



BONUS OPPORTUNITY

for classification of surfaces assignment:

classify your first and last name as a surface!

keep the 2 words separate and then combine as we did in class today

- orientation of letters is up to you
- if your first and last name do not have any letters in common, your name will create two surfaces!

Reminder:

- classification of surfaces assignment AND paper due Wednesday, 09/10
- Matthew DeRocher & Madison Sharp will be presenting