Today

Sections 4.9-4.14
Optical activity and compounds with more than one center of chirality

Next Class

Sections 5.4
Functional Groups

Sections 5.1 - 5.3, 5.5
Degrees of unsaturation, alkene nomenclature and structure, and how alkenes react

Remember to rework Test 1 by Friday. On a separate piece of paper, provide answers for any questions for which you did not receive partial credit. Please do not do the corrections on the actual test.

Determining Configuration (*R* vs *S*)

use Z+E nomenclature rules: 1, 2, 3, 4

Assign priorities to groups connected to chirality center

Point lowest priority group away

Draw a circle from 1st to 2nd to 3rd priority groups

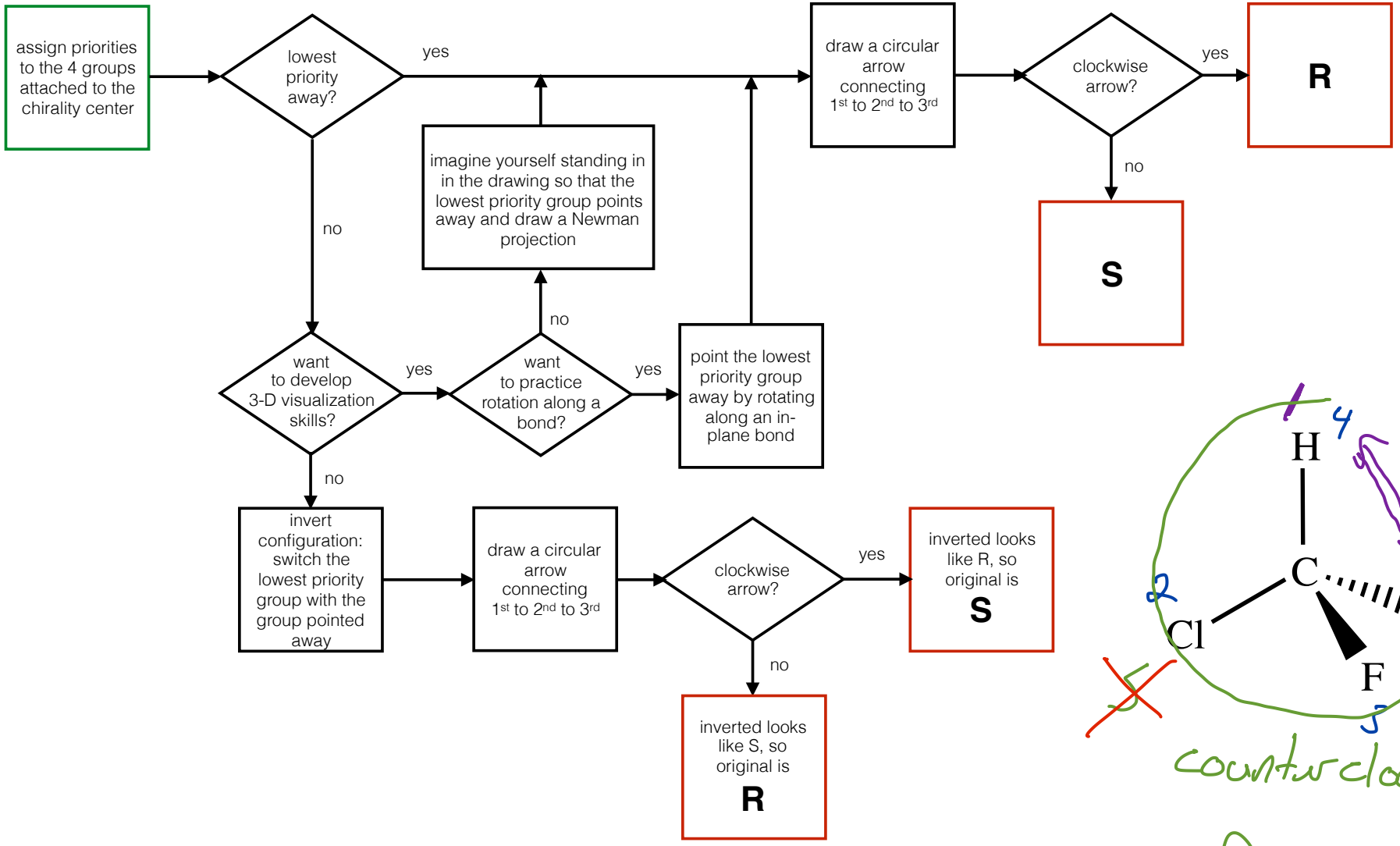
Clockwise circle is **R** configuration

Counter Clockwise circle is **S** configuration

a nonsuperposable mirror images can be made possible by putting 4 different groups on a C atom

when 2 and only 2 groups are swapped you have just inverted the stereocenter

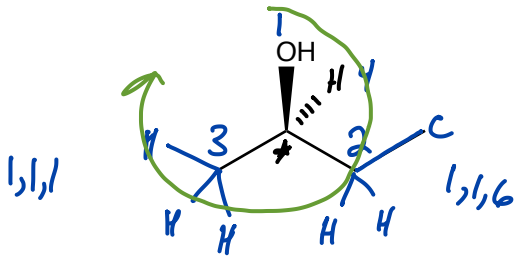
Determining Configuration (*R* vs *S*)



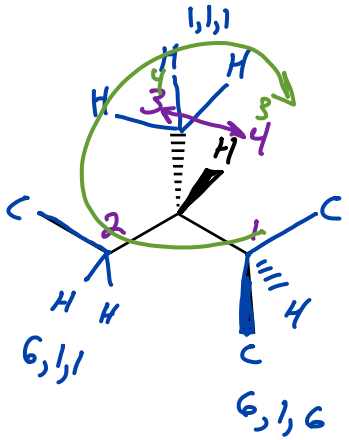
Practice determining the configuration of centers of chirality

Section 4.8

2-butanol

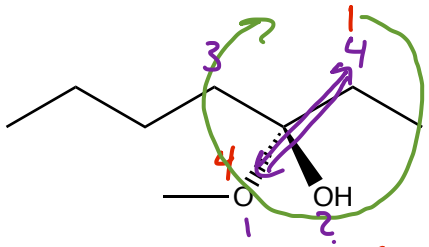


Determine the configuration of the chiral C R

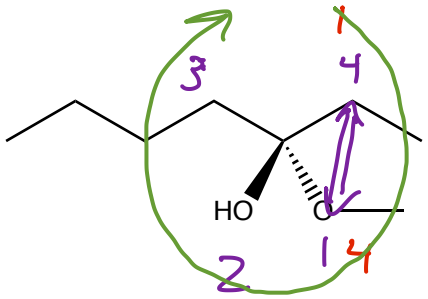


switch & invert 'cuz it's easier than redrawing

looks ~~R~~ but must S

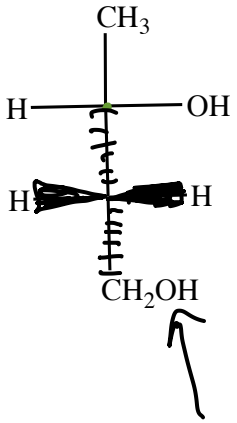


now it looks ~~R~~ but must be S



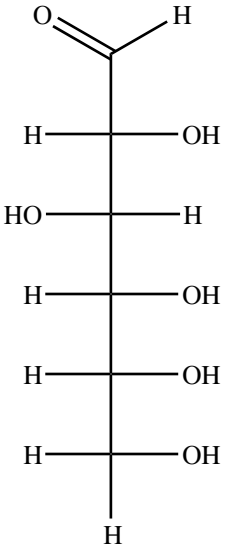
~~R~~ S

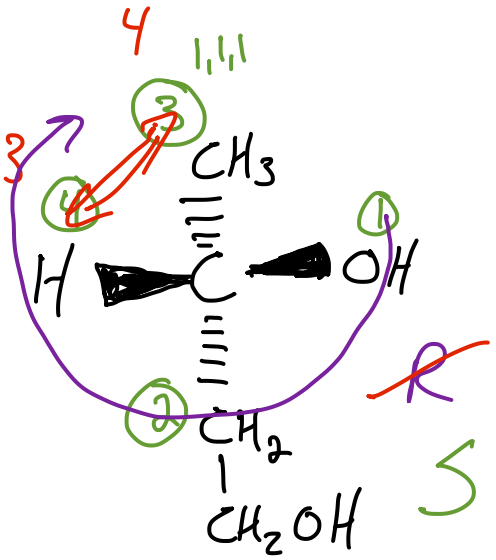
Fisher Projections : are easier to draw + show mirror planes more easily because of the eclipsing geometry

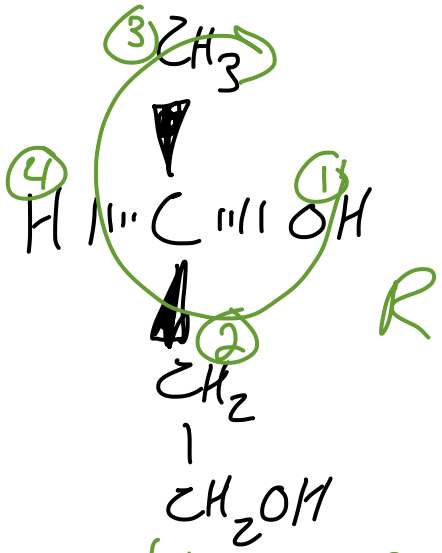


vertical bonds go away from us

the horizontal bonds point towards us







nonsuperposable mirror images of each other

1. Draw a tetrahedral C atom

2. Assign priorities to the groups

3. Place the lowest priority group so that it points away

4. Draw in priority groups 1 through 3 in the correct (clockwise or counterclockwise) orientation.

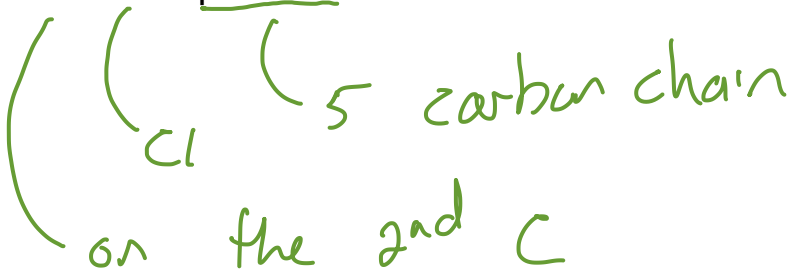
1. Draw the molecule

2. Assign priorities and check if the correct configuration is drawn

3. a. If correct, celebrate, you're done

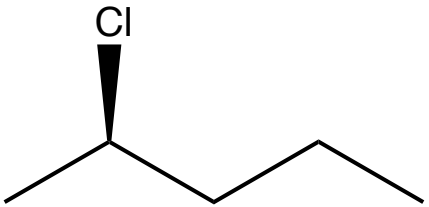
3. b. If incorrect version is drawn, redraw molecule shaping the positions of 2 (and only two) substituents.

R-2-chloropentane

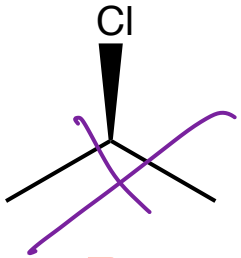


(2*S*,3S)-2-bromo-3-chloropentane

R-2-chloropentane

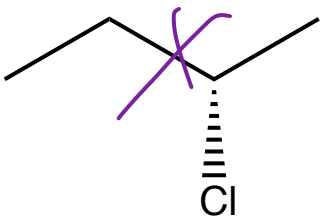


A

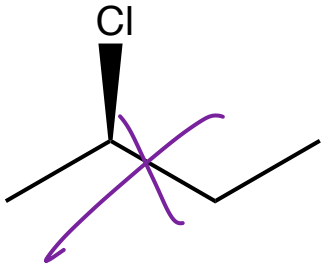


B

3 c chain

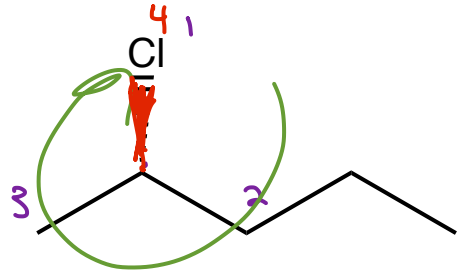


C



D

4 c chains



E

5

1. Draw the molecule

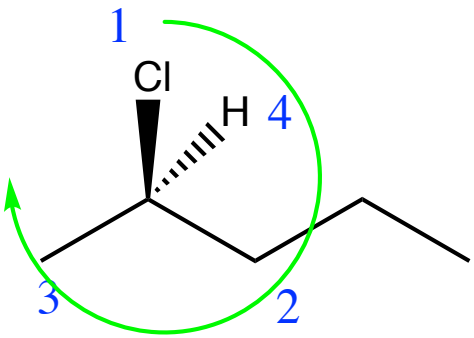
2. Assign priorities and check if the correct configuration is drawn

3. a. If correct, celebrate, you're done

3. b. If incorrect version is drawn, redraw molecule shaping the positions of 2 (and only two) substituents.

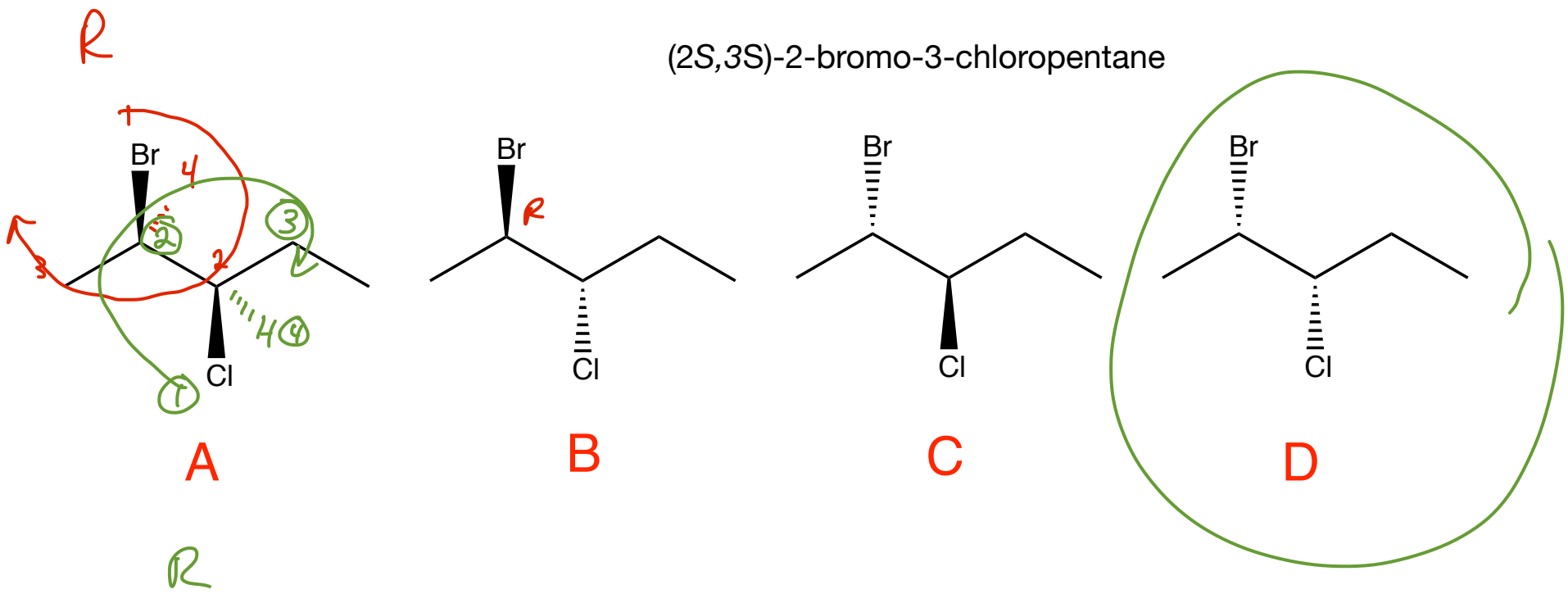
R-2-chloropentane

(2*S*,3S)-2-bromo-3-chloropentane



R

(2*S*,3S)-2-bromo-3-chloropentane



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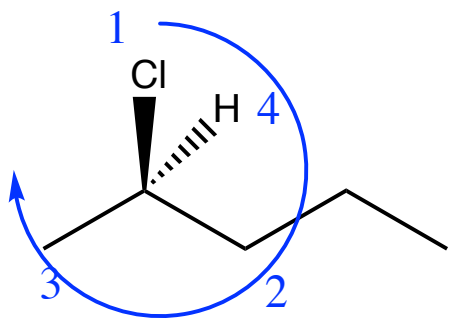
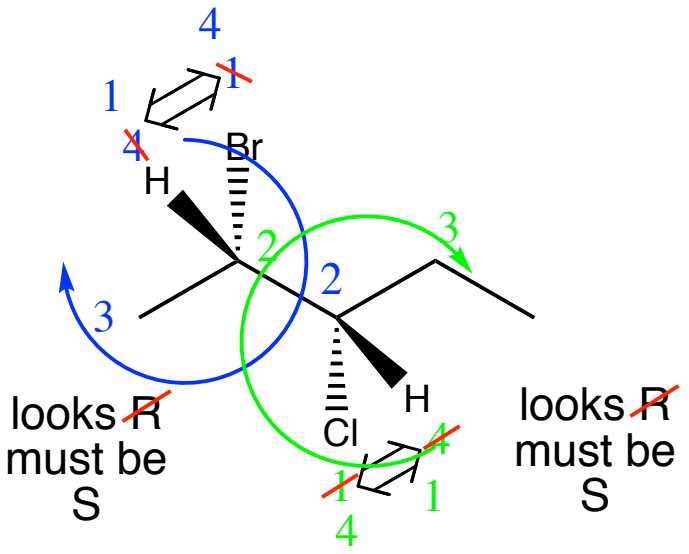
R-2-chloropentane



R

(2*S*,3S)-2-bromo-3-chloropentane



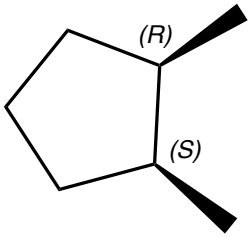
Maximum possible number of stereo isomers

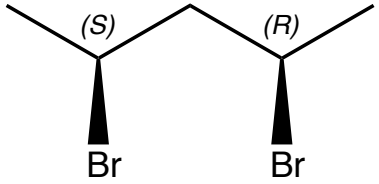
$$2^n$$

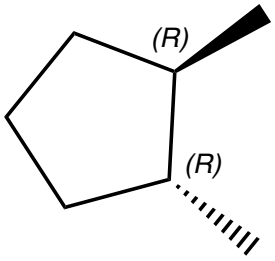
where n is the number of stereogenic centers

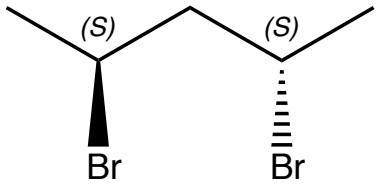
Stereogenic centers are locations that cause the molecule to exist as different stereoisomoers: R vs S, Z vs E

Enantiomers molecules that are **nonsuperposable** and **mirror images** of each other	and	Diastereomers molecules that have the same connectivity and are **nonsuperposable** but **NOT mirror images** of each other
The relationship can be identified using *R*,*S* system of nomenclature		
If all chirality centers have opposite configurations and Z,E alkenes, if present, remain the same		If at least one pair but not all pairs of chirality centers have opposite configurations or if Z,E alkenes, if present, have opposite configurations


(R)
(S)


(S)
(R)
Br
Br


(R)
(R)


(S)
(S)
Br
Br