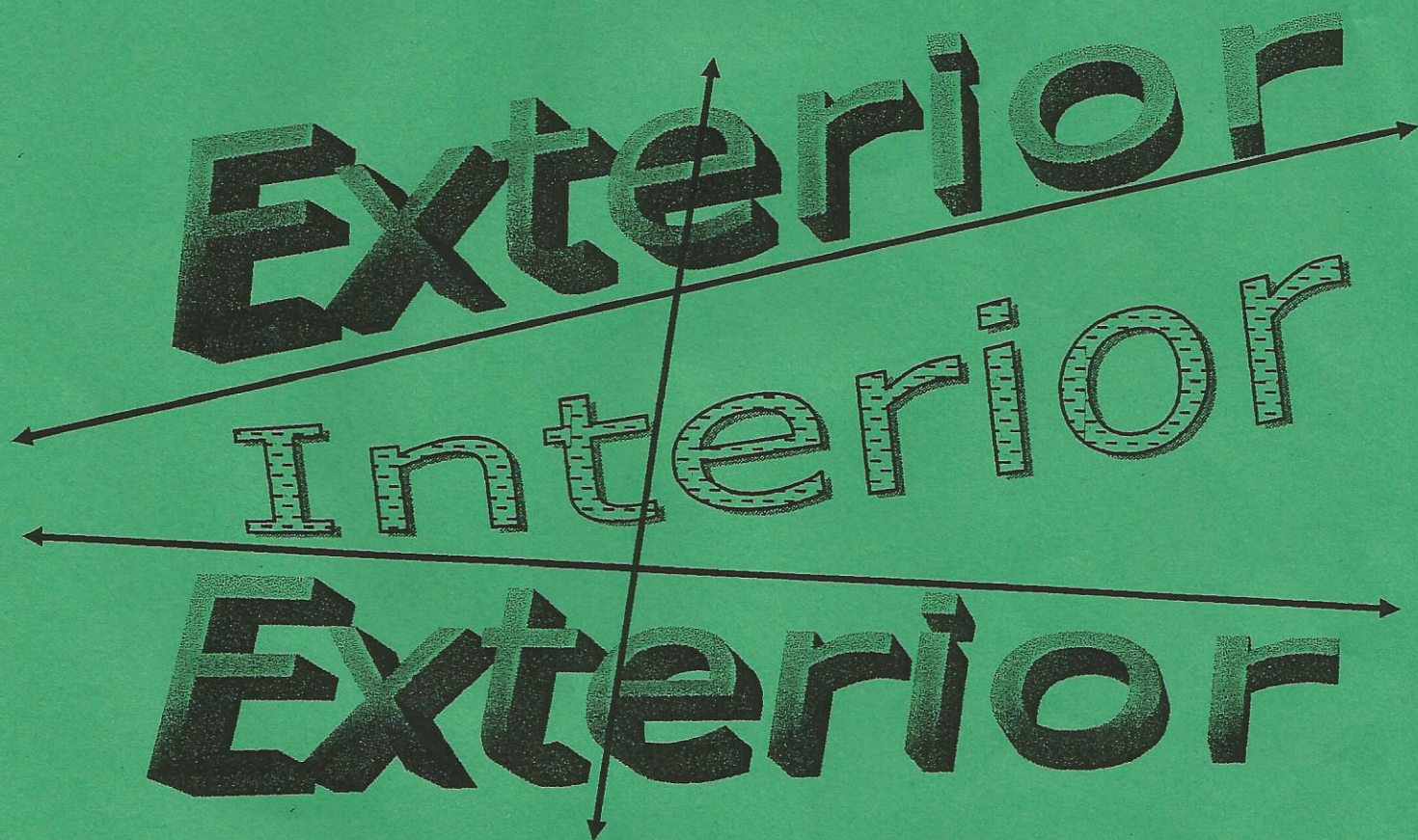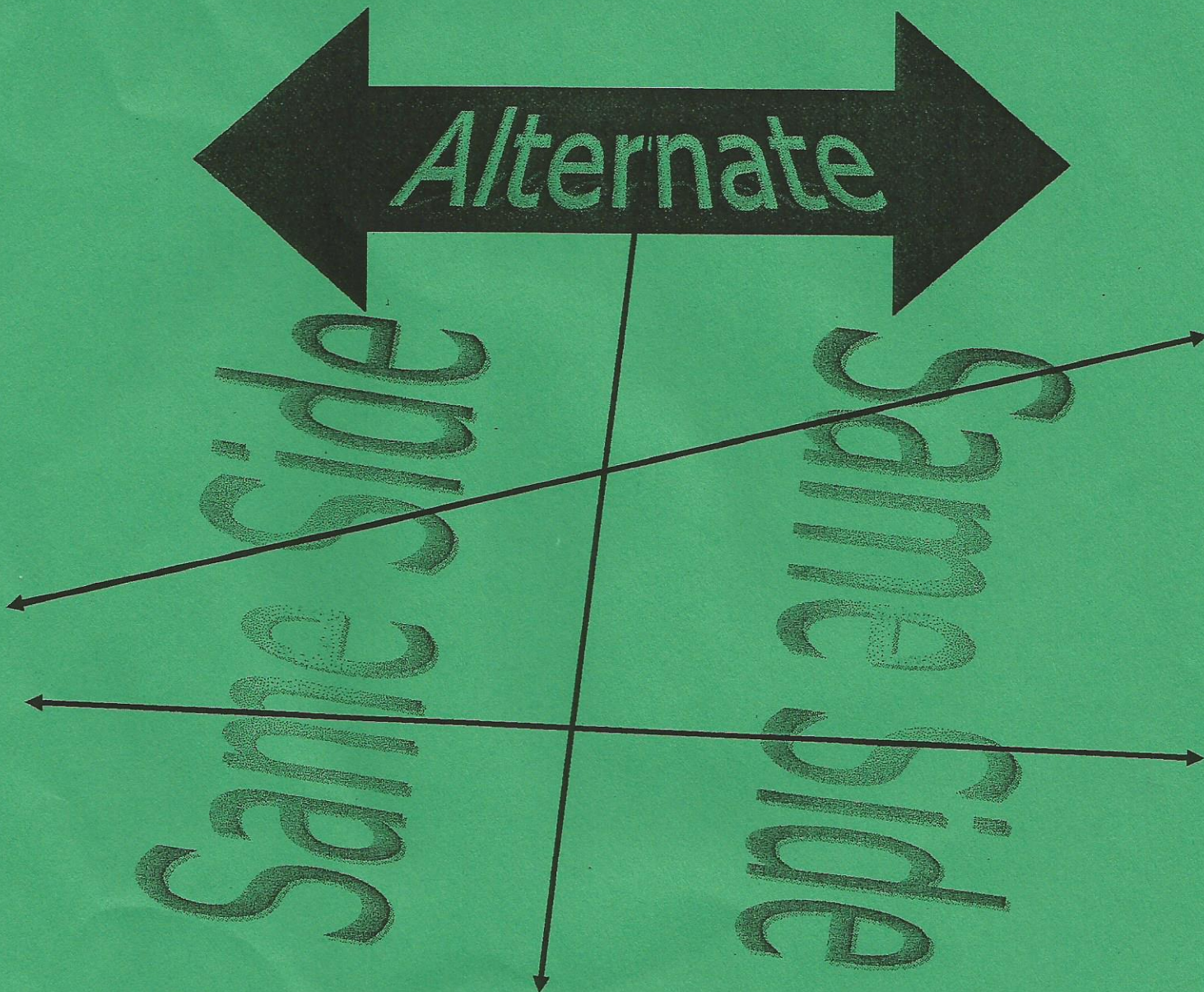# Interior/Exterior

Exterior

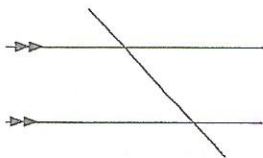Interior

Exterior

Alternate/Same Side

Angles Formed From Parallel Lines Cut by a Transversal

Name: _____ Period: _____

Yes, that is a mouthful, and so is each member of this next set of angles, but with a little practice and a little persistence it's easy!

First, what the heck are <u>Parallel Lines Cut by a Transversal</u>? Well let's see.

See how the parallel lines are both going the same direction? The <u>Transversal</u> is just an unnecessarily fancy name for that lines that intersects both of the parallel lines.

Now let's look at this...
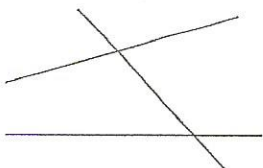
See the difference in this figure? The lines are not parallel. That's okay, all of these angles still have the same name. If the lines aren't parallel none of them are equal. Confused? As Yoda would say, "You will be." Ah, but who cares, he's just a silly green guy who lives in a swamp and has grammar problems. It's really not that bad. Let's look at the first pair of angles already.....

<u>Corresponding Angles</u> (memorize me)
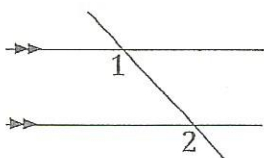
<u>Corresponding Angle Theorem:</u> If two parallel lines are cut by a transversal then corresponding angles are congruent and equal in measure.

If the lines aren't parallel they aren't equal; that's not so bad, huh? In your face, Yoda! No! Put me down! I didn't mean it! Okay seriously, corresponding angles are always on the same side of the transversal as each other, and on the same side of their respective parallel lines. That is how you remember them. In the previous example ∠1 is below and to the left and so is ∠2 so they are corresponding. Here are all of them.
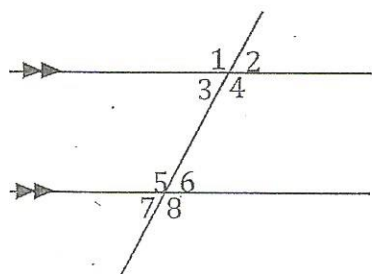
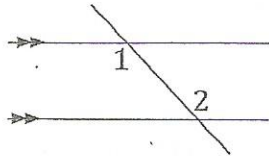∠1 and ∠5 are corresponding so... m∠1=m∠5

∠3 and ∠7 are corresponding so... m∠3=m∠7

∠2 and ∠6 are corresponding so... m∠2=m∠6

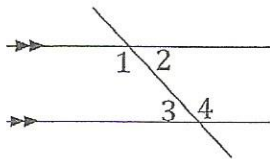∠4 and ∠8 are corresponding so... m∠4=m∠8

Alternate Interior Angles (memorize me)

Alternate Interior Angle Theorem: If two parallel lines are cut by a transversal then alternate interior angles are equal in measure.

Again, if the lines aren't parallel these are not equal. Alternate means opposite. Like the alternate side of the street from where you live. To get there go across the street! Interior means inside. (How often do you see an interior decorator hanging curtains on the outside of a house? Not a good idea... trust me.) So, alternate interior means "opposite inside". Opposite, as in on opposite sides of the transversal, and inside, as in inside the parallel lines. You have to kind of stare at them a while to see what I mean, but when you see it you won't forget it. So stare away! (I'm not joking about the staring. It actually helps to stare at them until you get used to where they are.)
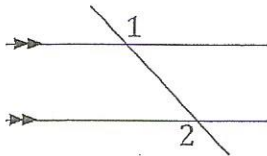

∠1 and ∠4 are alternate interior so... m∠1=m∠4

∠2 and ∠3 are alternate interior so... m∠2=m∠3

Also note that there are only two pairs of these things in the picture, so they are pretty easy to find.
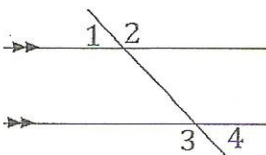
Alternate Exterior Angles (memorize me)

Can you guess where these are just by the name?

Alternate Exterior Angle Theorem: If two parallel lines are cut by a transversal, then alternate exterior angles are equal in measure.
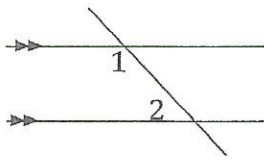
Yup, you guessed it. Exterior means outside, so these are "opposite outside" angles, as you can see if you stare again for a while...

∠1 and ∠4 are alternate exterior so... m∠1=m∠4

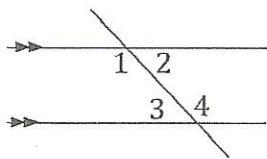∠2 and ∠3 are alternate exterior so... m∠2=m∠3

<u>Consecutive Angles</u> (memorize me)

<u>Consecutive Angle</u> <u>Theorem:</u> If two parallel lines are cut by a transversal then the sum of the measures of consecutive angles is 180°.

Again, if the lines aren't parallel this isn't true either. This one is a bit different. These are on the same side of the transversal and on the inside of the parallel lines. They are different because they add to 180°. That is because in the following picture ∠2 is actually corresponding to angle ∠3 and therefore equal. You already know ∠2 and ∠3 are a linear pair (or at least you should). So then it follows that ∠1 and angle ∠2 also add to 180°. Now begin the staring!

∠1 and ∠3 are consecutive so... m∠1+m∠3=180°

∠2 and ∠4 are consecutive so... m∠2+m∠4=180°

Great! So now we have corresponding, alternate interior, alternate exterior and consecutive angles. We will do a few exercises to help you memorize them. But... if you don't have a clue what they are go back and read and stare for a while longer until you do. Hey, I told you I would tell you the best way to learn this. If there was another way besides staring I would tell you. It's like you have to memorize these positions visually. For example, you can stare at a picture of your favorite person and then close your eyes and picture their face, right? It's the same thing with these angles. If you can close your eyes and picture where they all are then you're ready.

For your first set of problems, list all of the pairs of each type of angle. Refer to the instructions if you need to. (Don't feel bad about looking back. Everyone will need to on these first few problems.)
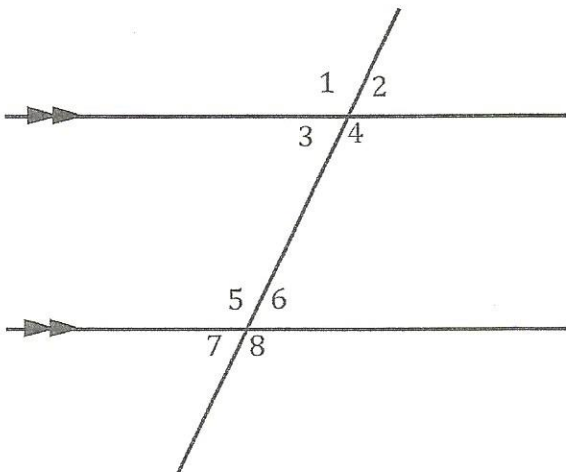
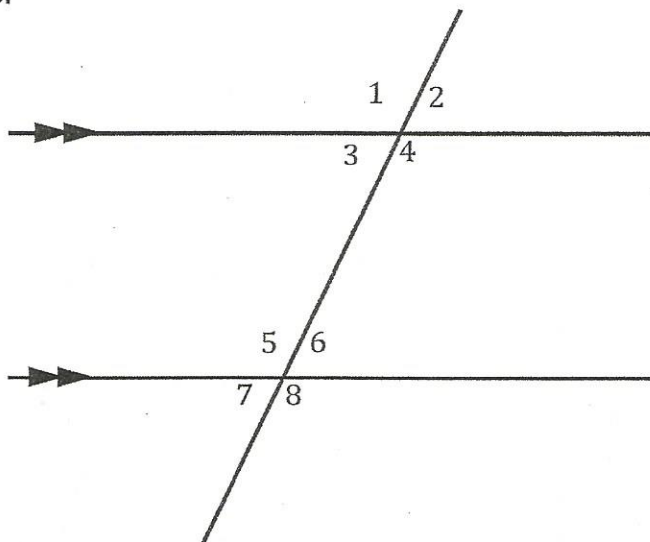1. List all the pairs of corresponding angles:

2. List all the pairs of alternate interior angles:

3. List all the pairs of alternate exterior angles:

4. List all the pairs of consecutive angles:

Easy as an abelian ring!!!! Let's do some more...

For our first exercise, bubble the correct answer choice for each item below. Refer to the previous pages if you need to.

```
                                    1 / 2
 ———————————▶▶——————————————————————————————————
                                    3 / 4



                              5 / 6
 ———————————▶▶———————————————————————————————————
                           7 / 8
```

1. ∠1 and ∠5 are...

A. Corresponding
B. Alternate Interior
C. Alternate Exterior
D. Consecutive

2. ∠8 and ∠4 are...

A. Corresponding
B. Alternate Interior
C. Alternate Exterior
D. Consecutive

3. ∠2 and ∠7 are...

A. Corresponding
B. Alternate Interior
C. Alternate Exterior
D. Consecutive

4. ∠3 and ∠6 are...

A. Corresponding
B. Alternate Interior
C. Alternate Exterior
D. Consecutive

5. ∠6 and ∠4 are...

A. Corresponding
B. Alternate Interior
C. Alternate Exterior
D. Consecutive

6. ∠2 and ∠6 are...

A. Corresponding
B. Alternate Interior
C. Alternate Exterior
D. Consecutive

7. ∠4 and ∠5 are...

A. Corresponding
B. Alternate Interior
C. Alternate Exterior
D. Consecutive

8. ∠1 and ∠8 are...

A. Corresponding
B. Alternate Interior
C. Alternate Exterior
D. Consecutive

9. ∠3 and ∠5 are...

A. Corresponding
B. Alternate Interior
C. Alternate Exterior
D. Consecutive

10. ∠4 and ∠8 are...

A. Corresponding
B. Alternate Interior
C. Alternate Exterior
D. Consecutive

Great Job, these are tough to remember which is which. If you are struggling, go back and try to memorize what each one looks like. (like remembering a picture) If you do that these will become very easy. Let's do some more!

Bubble the correct answer choice from each item above.

#1.	#2.	#3.	#4.	#5.	#6.	#7.	#8.	#9.	#10.
○A.	○A.	○A.	○A.	○A.	○A.	○A.	○A.	○A.	○A.
○B.	○B.	○B.	○B.	○B.	○B.	○B.	○B.	○B.	○B.
○C.	○C.	○C.	○C.	○C.	○C.	○C.	○C.	○C.	○C.
○D.	○D.	○D.	○D.	○D.	○D.	○D.	○D.	○D.	○D.