Inductive Reasoning Exercise #2 (Section 1.4)   NAMES:

Turn in one paper per group but be sure all members of the group have seen the final answers. Circle your name if the paper that gets turned in is your copy.

The following are selected questions (numbers copied from book) from Set II of the exercise set.

Here is a set of three circles. Two points have been chosen on the first circle and a straight line segment drawn between them. The circle is separated into two regions as a result. Three points were chosen on the second circle and connected with three line segments to form four regions. Four points were chosen on the third circle and, after being connected in all possible ways, eight regions resulted.
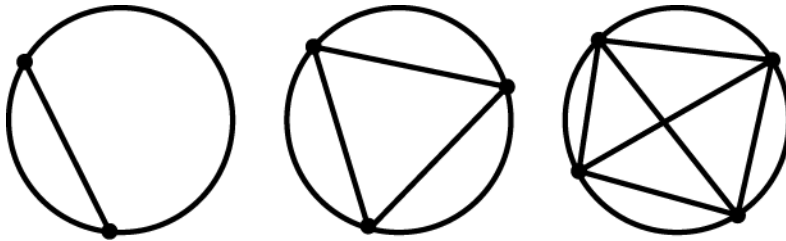

Here is a table that includes the results so far. Two more cases have been added.

Number of points [on circle]	2	3	4	5	6
Number of regions formed	2	4	8		

1. Guess from the pattern in the second line of numbers what the missing numbers are. [Fill in the table with your guesses. Do not draw the circles out yet.]

2. [Below is a pair of circles.] Choose five points on one circle and six points on the other. Join the points of each *in every possible way*.
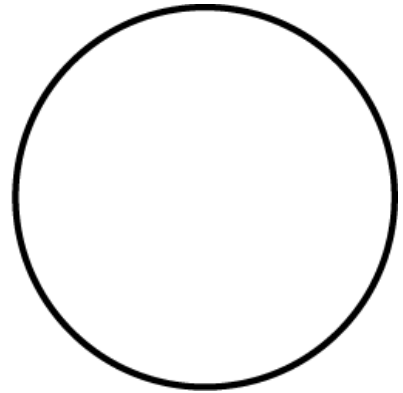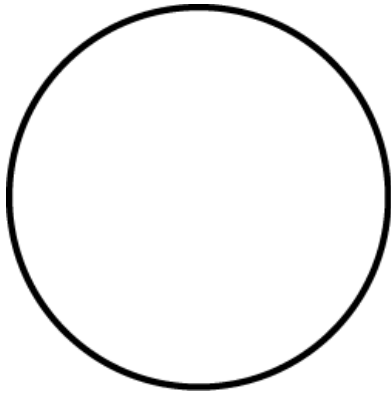
3. How many regions are formed in each? [Did everyone in your group get the same answer?]

4. Do both results agree with your guesses? [Inductive reasoning can lead us to incorrect conclusions. Sometimes what appears to be a pattern does not hold out when extended.]

[Below are two figures to be cut out from graph paper. I have already done so for students in class. We will play with them here.]
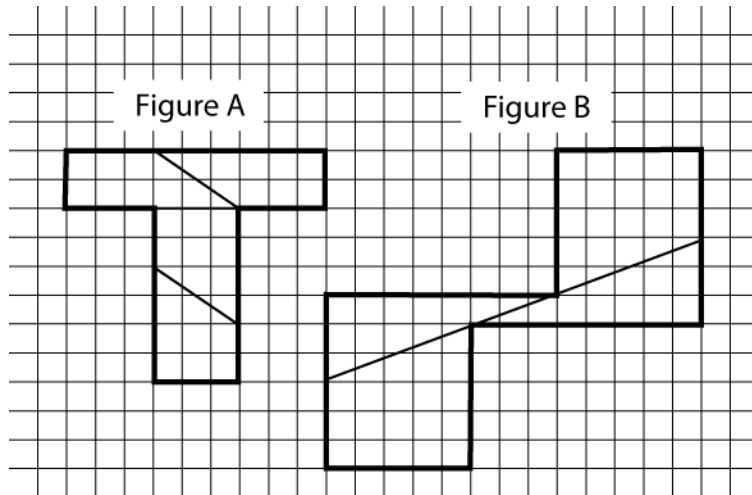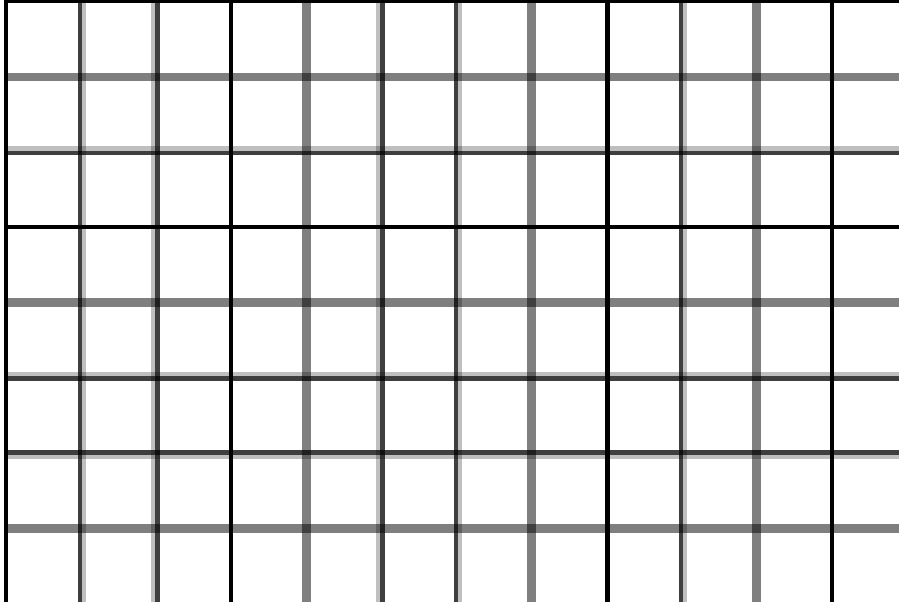

5. Explain how it is possible to tell, without having to count all the small squares, that the area of figure A is 36 square units.
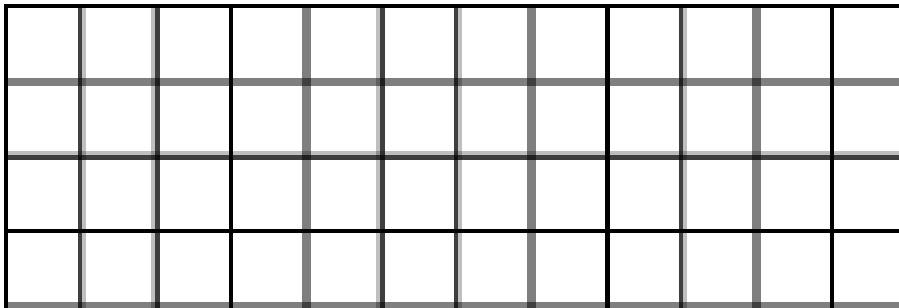
6. What is the area of figure B?

[**Get the cut-out version of figure A** that I distributed in class or make your own.]

7. Rearrange the pieces to form a square. Make a drawing of the arrangement. [Show the cut lines please.]

8. What is the area of the square?

9. Rearrange the pieces again to form a rectangle with a width of 4 units. Make a drawing of this arrangement. [Show the cut lines please.]
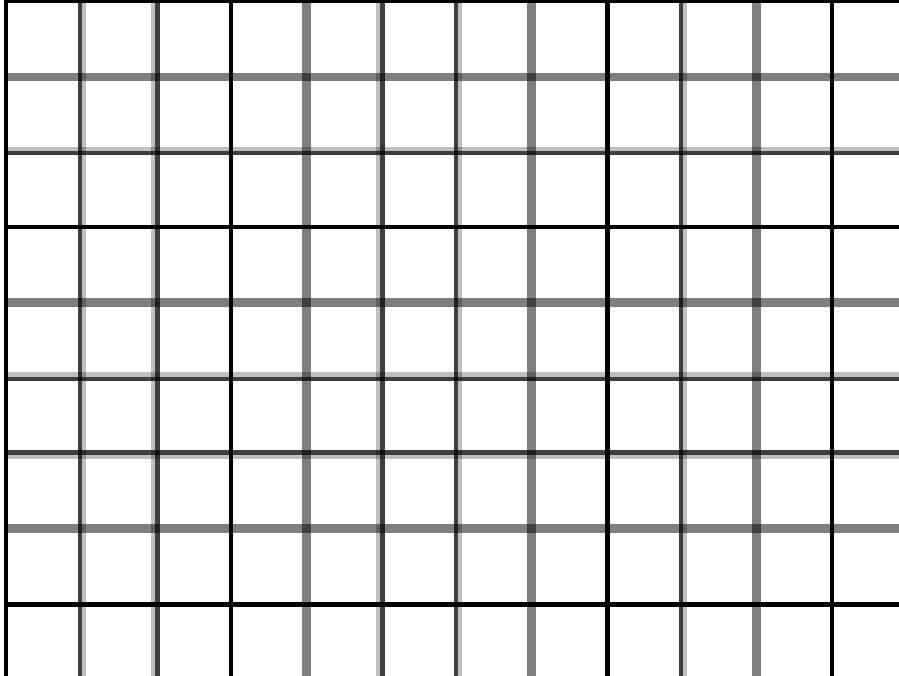
10. What is the area of the rectangle?

11. Does the area of the figure change when its pieces are arranged in different ways?
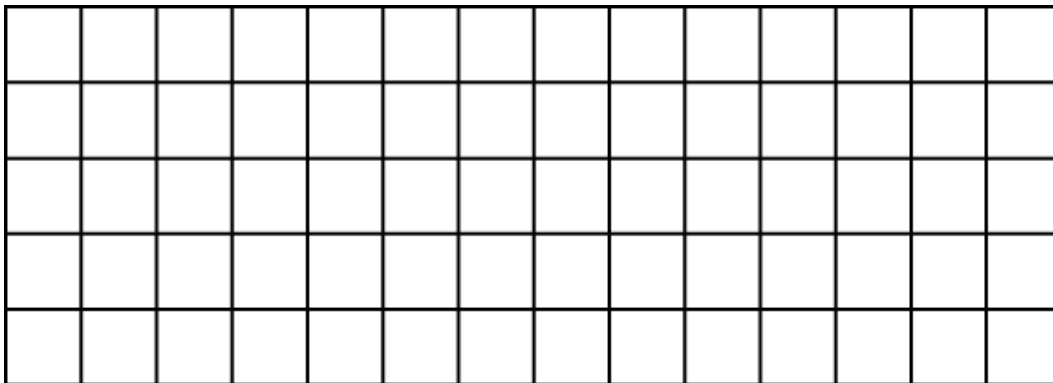
[**Get the cut-out version of figure B** that I distributed in class or make your own.]

12. Rearrange the pieces to form a square. Make a drawing of the arrangement. [Show the cut lines please.]

13. What does the area of the square seem to be?

14. Rearrange the pieces again to form a rectangle with a width of 5 units. Make a drawing of this arrangement. [Show the cut lines please.]

15. What does the area of the rectangle seem to be?

16. What seems to happen to the area of figure B as its pieces are arranged in different ways?

17. Do you have any ideas about why this happens? Please explain.