Geometry Design Project **Name _____**
September 25, 2008

On the homework you just turned in you worked out the perimeter and area of the shape we explored last class. The shape actually comes from a piece of property in San Rafael about 3 miles from school. If you know San Rafael, the road that cuts across the bottom left corner of the picture is I-580 and the large white building is the bit Home Depot store.

The real point of this project is to put together a plan to develop the site and build a new community center complex.

Phase I: Scaling

Yesterday you worked with the shape as it was sized on the paper. Given the fact that $AB = 263.025$ meters in real life, calculate the length of each side of the actual property

Phase II: Property Division

The City of San Rafael is interested in developing the property you have been working with, building a community center and athletic fields on the site. To pay for part of the construction the city will sell half of the property to commercial developers.

The objective of this phase of the project is to divide the property exactly in half. In addition to completing correct calculations, you will also be asked to explain why you divided the property the way you did. Keep in mind that you are dividing a piece of property for development so the shortest mathematical solution may or may not lead to creating two pieces of property that are good for development.

You may choose to do this phase of the project by hand or on Geometer's Sketchpad. You may want to do some initial work on a sheet of paper (the handout with correct lengths would probably be helpful) as you try various methods for dividing your property. Work in pencil and be willing to try different methods out before settling on a final method of dividing the property. Keep track of your reasoning and the choices you made so that it will be easier to write up your explanation for the final submission.

If you need a clean picture of the property you can print either of your GSP documents – make sure to print directly from GSP as the documents are to scale – don't import them into another file and then print! Make sure you are mindful of paper waste and only print if you really need to.

Phase III: Community Center Planning

The final phase consists of laying out the community center complex on the piece of property you created above. In addition to including each of the components listed below you should think about how the entire complex is designed. In addition to your explanation of why you divided the property in the manor you chose (in Phase II) you will also be asked to explain your choice of lay-out.

Athletic / Recreation Fields: The complex should include each of the following fields:

- 3 soccer / football / lacrosse fields – each field is a 70 meter by 110 meter rectangle
- 2 softball fields – each field is a quarter circle with radius 70 meters
- 2 baseball fields – each field is a quarter circle with radius 105 meters

Community Center Building: The complex should include a main building that will house a day-care center, meeting rooms, and offices. The building should meet the following characteristics:

- The total area of the building's footprint should be 10,000 square meters.
- The building may not be a rectangle, triangle, or circle, though the building may consist of rectangle, triangle, and circular pieces.
- The building should be centrally located with easy access to the entire property

Parking Lot: The city anticipates a maximum of 300 people at any given time using the community center complex. A parking lot is needed for the complex that meets the following criteria:

- There should be enough parking spaces for 60% of the maximum possible number of people using the center.
- Each parking space must be 2 meters by 5 meters.
- The parking lot can be rectangular.
- The parking lot should be placed in a manner that is convenient for the community center building and the athletic fields, while not detracting from the overall property.

Cost: The city needs to determine how much your project will cost before finalizing the project. Determine the cost of your project using the following information:

- It costs $450 per square meter to develop the athletic fields.
- It costs $4500 per square meter to develop the community center.
- It costs $180 per square meter to develop the parking lot.
- The rest of the land costs $90 per square meter to develop.

As in Phase II you may choose to do this by hand on a print out of the map, or with Geometer's Sketchpad. As before, try things out before making final decisions. Be creative, think about what would be the best design possible for the community center, and have fun.

What you'll hand in:

Each of the following pieces of the project will be **due Thursday, October 2** unless otherwise noted.

- Your original perimeter and area calculations *(hand in on Thursday 9.25)*
- Your corrected perimeter and area calculations (if you had any mistakes)
- Your neat calculations of the dimensions of the property in real life and the location of the property division.
- Your neat calculations used to determine the scaled down size of the sports fields as well as the size and shape of your Community Center Building and the Parking Lot.
- A Geometer's Sketchpad print-out of the property with the property division and the location of the building, fields, and parking lots correctly drawn to scale.
- Your neat calculation of the total cost of the project
- A short written explanation of why you divided and laid out the property the way you did. **Your explanation should be written in complete sentences, be typed, and be in the range of 250-500 words.**

How you'll be scored:

Points	Project Component
10 pts	Original area & perimeter (1st night homework)
5 pts	Progress check of property division calculation
10 pts	Calculations of the correct property scale, the lengths in real life, the size of the playing fields
5 pts	Calculations of the size and shape of the community center building and the parking lot
5 pts	Calculations of the size and shape of the parking lot
5 pts	Map including correctly scaled building, fields, and parking
10 pts	Written explanation of your property division and property layout
50 pts	**Total**