# Topographic Map Assignment
Computers, Mr. Martin

**BACKGROUND:**

Topography is the shape of the land. As you may know from your Earth Science book, *Science Explore: Focus on Earth Science*, chapter 6 (Prentice Hall 2001) ("*Earth Science"*), the "**topography** of an area is determined by the area's elevation, relief and landforms." (p. 173) **Elevation** is the "height above sea level of a point on the Earth's surface." (Id.) **Relief** is the "difference in elevation between the highest and lowest parts of an area." (Id.) "A **landform** is a feature of topography formed by the processes that shape Earth's surface. All landforms have elevation and relief." (Id.) Examples of landforms include plains, mountains and plateaus. (Id. at 174-175.)

The topographic map you will be using is from the United States Geological Survey (USGS). It has a scale of 1:24,000 or 1 centimeter (cm) equals 0.24 kilometers (km). It is divided up into a grid pattern making square. Each square is 1km x 1km or 1square kilometer. A topographic map is two dimensional or flat. To represent the three dimensions needed to show elevation, relief and slope, topographic maps use contour lines. (*Earth Science* at 189.) A **contour line** connects points of equal elevation. (Id.) The **contour interval** is the "change in elevation from contour line to contour line." (Id.) The contour interval on the map you will be using is 20 feet. If you stay on a contour line you will be at the same elevation. As you cross contour lines you will be going either up or down. The Gallery of Virtual Topography, http://reynolds.asu.edu/topo_gallery/topo_gallery.htm/ , has many short movies that show how you can visualize the actual topography from the contour lines on a topographic map. If contour lines are closely spaced, then the slope is steep. If contour lines are far apart, then the slope is gentle. V shaped contour lines represent either a ridge or a valley. If the v shape points downhill, it is a ridge. If the v shape points uphill, it is a valley. See *Earth Science* at 190.

**GET MAP:** Locate the appropriate topographic map from the United States Geological Survey (USGS) site, http://www.usgs.gov/. Go to "Maps, Imagery, and Publications," and then, under Maps, "Download digital scans of topo maps." Then go to "Map Locator." In the search box, type La Jolla, Ca. Click on the square named La Jolla (not La Jolla OE W). Then click on the bubble you created. Download: La Jolla7.5X7.5 1996.

**FIND YOUR HOUSE LOCATION:** Locate approximately where your house is.[1] Navigate on the map using the + and – buttons on the pdf map and the hand tool. Zooming in using the + and – buttons on the map itself gives very high resolution. Do not use the control key and mouse scroll button to zoom in.

[1] This map covers La Jolla, Pacific Beach, University City, Clairemont, and surrounding areas. The houses for most students will therefore be on this map. If the location of your house is not on the map, you can download one of the surrounding maps. If you need help let me know.

**PUT DOT AT HOUSE AND LABEL "MY HOUSE":** Zoom in on the area that includes your house so that the vertical dimension on your map is about one to two kilometers. Each square on the map is one square kilometer. Using the annotation feature on the map, mark where approximately your house is with a dot. Make sure your dot is a contrasting color compared to the map color so that a viewer can see it. Again using the map's annotation features, create a text box next to the dot that says "My house." Use an appropriate size font and color.

**PREPARE A WORD DOCUMENT WITH THE FOLLOWING:**

1. A screen shot of your map showing your house. The shot should include a vertical distance of 1 to 2 kilometers.

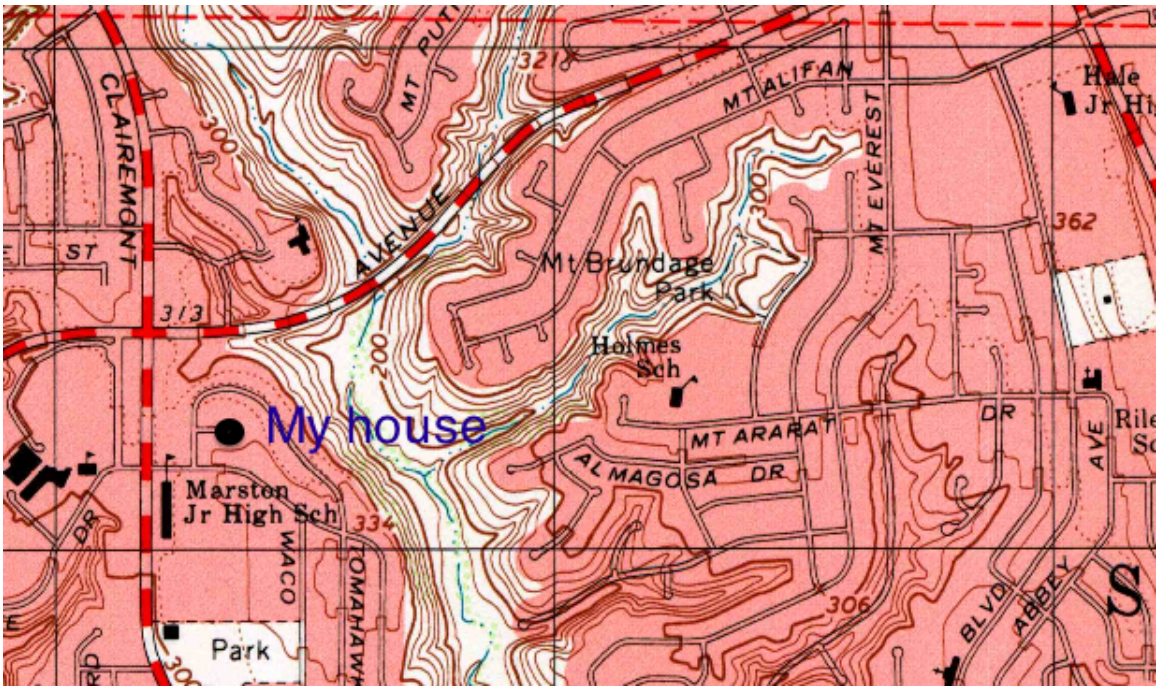
2. The approximate elevation of your house.

3. A paragraph describing the topography near your house. Include a large enough area to make your description interesting.

***Example for #s 1-3***

An example of 1-3 follows:

1.




2. My house is at about 330 feet. *(By the way, this is not my house. I just selected this pretty much at random. It also had interesting topography.)*

3. It is relatively flat near my house and remains flat going west and south around Marston Jr. High School and Clairemont High School. However, as you proceed east there is a steep decline in elevation from over 300 feet to 200 feet over a horizontal span of only about 0.1 km. It flattens out at about 190 feet and then rises again to over 300 feet. This is part of Tecolote Canyon.

***End of Example for 1- 3***

4. Go to Google Earth and take a screen shot of the same area as covered by the screen shot of your topographic map. Put this on your Word document. Hint – take a little larger screen shot than your topographic map. Then resize and crop in Word to make it the same area as your topographic map screen shot. Compare and contrast the view and information available from the two maps/images.

5. What is the elevation of Stella Maris Academy?

6. What is the elevation of the top of Mount Soledad (at the point labeled Easter Cross)?

7. Generally describe topography of Marian Bear Memorial Park that runs along State Route 52 between I-5 and I-805. Describe how you know from the map what the topography is.

8. What is the lowest land elevation on the map? Why is that an easy question?

9. What is the lowest elevation under the ocean on the map?[2]

10. Using the map, what is the distance in kilometers (to the nearest tenth of a kilometer) between Stella Maris Academy and La Jolla Cove? (Hint: Use the scale at the bottom of the map. Use a ruler ***gently*** against the monitor. You cannot zoom in and out once you measure.)

11. Using the map, what is the distance in kilometers (to the nearest tenth of a kilometer) between your house and Stella Maris Academy?

12. If you finish the above, using the drawing tools of Word, make a topographic map of a cone that is ten feet high and ten feet in diameter at the base. You must have at least 5 contour lines. You must give a scale.

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[2] Notice that we have a very steep decline in the sea floor off of the northern La Jolla beaches. The topographic and geologic diversity of these marine canyons also contributes to the biological diversity in the area and made it an excellent location for the Scripps Institution of Oceanography, now part of the University of California, San Diego. See generally, eScholarship: Raitt and Moulton, *Scripps Institution of Oceanography, First Fifty Years* (1967), http://escholarship.org/uc/item/59s4x2cr.