

MTH 111 Final Project  
Fall 2020

The directions below will provide you with the list of measurements to take that you will need to complete the final project for this course. A further set of instructions will be released later to direct you what to calculate or research based on what you collect here.

1. Take a stick (yard stick, or any other kind of movable rod that can be physically measured with a ruler) and standing it up in the sunshine on flat ground. Record the following information:
  - The time of day
  - Measure the length of the shadow from base to tip
2. Find a tree, a telephone pole or a large building that is too tall to physically measure with a ruler without special equipment. You may need to measure the shadow with twine (something that doesn't stretch too much) or mark the distance with your shoe length and measure the shoes to get the conversion. At the same time of day as the above measurement (preferably the same day, or not many days later):
  - Measure the length of the shadow
3. Find a building with a slanted roof (a house or a garage should do).
  - Take a picture of the building so that you can see the angle of the slanted section such as shown. Take the picture edge on so that the wall supporting the roof is directly facing you and not at an angle.
  - Measure the base of building supporting to roof.
4. Find three traffic signs.
  - One of signs should be a stop sign
    - Measure the length of one edge of the sign
    - Measure the width across from edge to edge (the "diameter")
  - Measure any two other signs of different shapes (for instance, a yield sign is an equilateral triangle, so measure one edge; or a speed limit sign is a rectangle so measure length and width, etc. Most residential neighbors have things like speed limit sign, pedestrian crossing signs, stop signs, etc. Freeways also have mile marker signs every 1/10 to every 1 mile. Railroad track signs are circular, if you know where any are.
5. Find a large building that is roughly box-shaped (a rectangular solid). Find the size of the length and width of the building (for instance, using your feet end-to-end, or some other method). For the height, count the number of floors. The typical height of a story is about 14 feet, so you can use that to estimate the height.
6. Find a coffee mug.
  - Measure the height of the mug.
  - Measure the diameter of the mug.



7. Find at least two other geometric solids in the world. They can be things in your home or outdoors. Pyramidal shaped buildings (such as the Rock-n-Roll Hall of Fame), or a grain silo (can be of various shapes, but often are cylindrical) or a water tower. Take pictures of these objects so that all the relevant dimensions are clearly visible in the image. You may need to place a scaling object next to the image if you are not able to measure any of the dimensions yourself. If you have one reliable dimension, we can get the others from the image. If you have none, then we can obtain only relative sizes, which will not be enough to obtain the volume.
  
8. Find an object—it can be two- or three-dimensional—that we did not discuss in the geometry chapter. Take a picture of it. As with the other objects, you need to identify at least one measurement in the image so that we can obtain estimates of the others from the image. Use Google or another search engine to try to identify the name of the shape (it may fall into a class of shape like a prism or a cylinder, for instance). You'll need to identify the formula for the area (if two-dimensional), or the volume (if it's three dimensional). See Chapter 12 if you are not sure what we will be and won't be discussing in the geometry section.

Once you have obtained these measurements, put them in a safe place. The directions for what to do with them will be released after we get to Unit 3 or so, since you'll need information from Units 2-4 to complete the calculations you'll need to do.