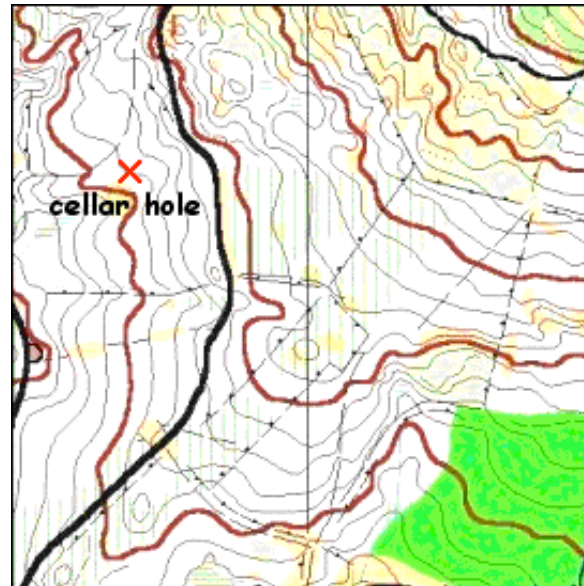


# Math Forum - Problem of the Week

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## Making a Map

You've been given the map below. You've offered to generate a more detailed map that shows the locations of some additional landmarks.



[larger image to print out](#)

The area on the map is 1000 meters by 1000 meters with an old cellar hole marked on it. The top of the paper is due north.

A group of people walked around the area and made notes about the directions and distances to other objects that should go on the map. The distances are given as if the terrain is flat and the directions are given as bearings. (To find the bearing E 35 N, face east, and then turn 35 degrees to the north. Now you are looking 35 degrees north of east.)

Some people took good notes and provided enough information, while others did not, though everyone's information is true. Using all of the information they gathered, carefully explain which of these objects you will and will not be able to uniquely place on the map:

1. To get to the elm tree, start at the cellar hole and go 700 meters due east.
2. The USGS marker is 500 meters from the elm tree and 665 meters from the cellar hole.
3. The boulder is due west of the USGS marker and due south of the cellar hole.
4. The big maple is due north of the marker, the spring is due west of the marker, and the big maple is E 50 N of the spring.

**Extra:** Can these two items be placed on the map?

1. To get to the eagle's nest, stand at the cellar hole. Face E 42 N and go 410 meters. Then go 315 meters until you meet the line between the cellar hole and the elm tree.
2. The old well is E 77 N of the boulder and W 34 N of the USGS marker.