Lab 05: navigation: tangents and mount Everest

Tangent method:

- measure a distance from the object (huge tape measure can be useful here)
- measure the degrees you see in your astrolabe to the top of the object
- use the tangent calculator on your phone: tan = opposite (height)/adjacent (distance)
- you could also use: distance x tangent θ = height
- make sure to add your eye height
- use this method to determine the altitude of the same objects
- try to calculate the altitude of Mauna Kea by looking up the distance, knowing the elab is at 800 meters altitude (confirm this with the GPS on your phone)
- using google earth, look up the distance between several peaks on your map and make a scale ruler for your map
- use this scale ruler to find the distance to other peaks
- repeat the tangent method to find the height of each peak you can see: Hokuula, La'e La'e, Mauna loa...

Questions:

1. who measured the height of mount Everest?
2. how did he/she do it?
3. why do you need to know the elevation of your observation?
4. if you measure Mauna Loa as 5 degrees and it is 60 km away, what altitude above sea level is Mauna Loa?
5. Look up the true altitude and calculate your error

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