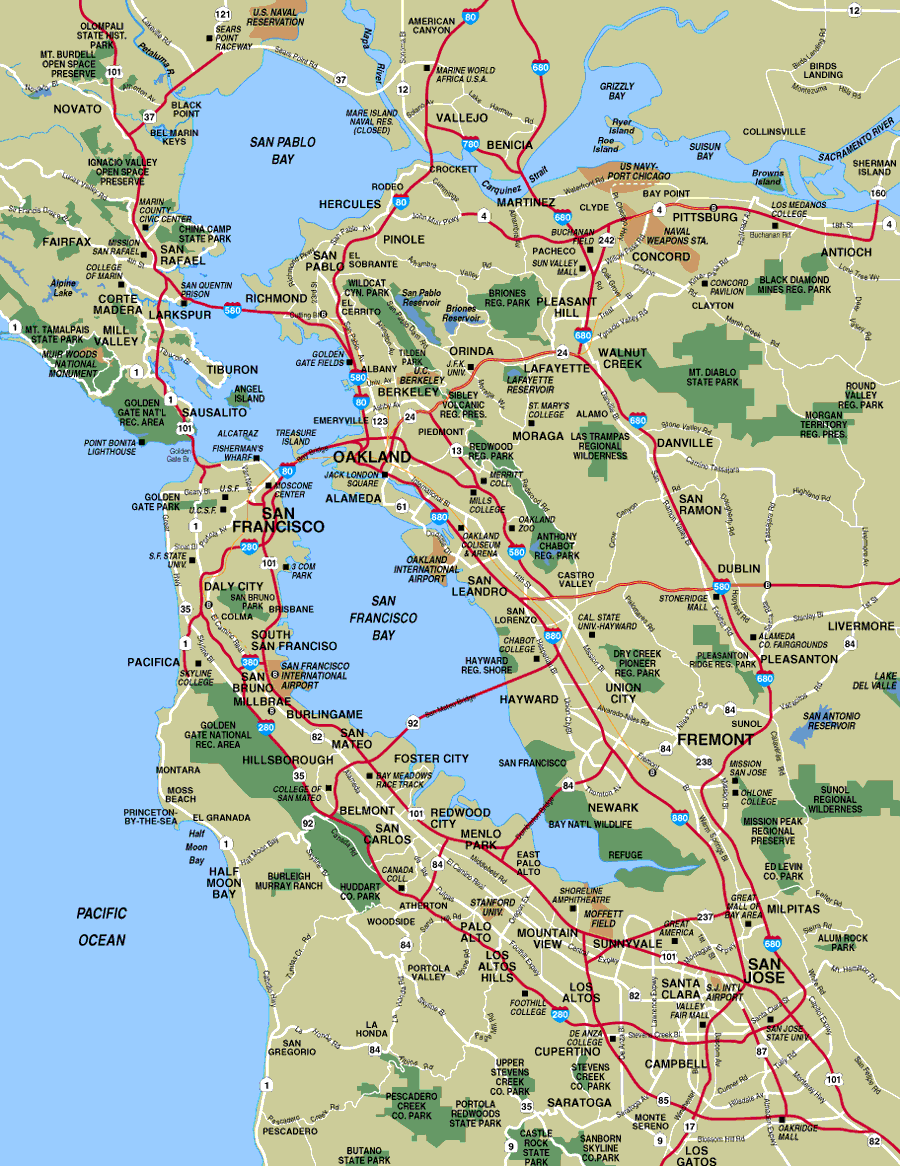
**Multiple Choice**: Provide the best answer for each question. Be sure to make each choice perfectly clear. (2 points each)

1. Identify the scale of each map: write which one you consider “small scale” and which you consider “large scale” under the chosen map.

1. In a cylindrical projection that preserves shapes, areas at high latitudes appear \_\_\_\_\_\_\_\_.
   1. larger than areas of the same size located nearer to the equator
   2. smaller than areas of the same size located nearer to the equator
   3. the same size as areas of the same size located nearer to the equator
   4. None of the above
2. In a scientific report, what is an abstract?
   1. paragraph explaining data not included in the written report
   2. A summary of the study that includes what the study is, the findings and what they mean
3. A series of footnotes that explain more abstract concepts
4. The collection of appendices found at the end of a study
5. Which of the following are the four major sections of a scientific report (and in the most common order)?
   1. Appendices, Overview, Literature Review, Discussion
   2. Introduction, Literature Review, Abstract, Conclusion
   3. Discussion, Methods, Purpose, Acknowledgements
   4. Introduction, Methods, Results, Discussion
6. In a research study, which of the following times do you need to cite your source?
   1. Whenever you refer to your own primary data from that particular study
   2. Only in cases where you use a direct quote from another source
   3. Only in cases where the data is not publically available
   4. Whenever you refer to ideas of others
7. The rectangular land division scheme in the United States adopted after the American

Revolution where the land is divided into square miles is called:

a. long-lot system.

b. metes and bounds system.

c. township-and-range system.

d. American land system.

1. GPS was developed
   1. During the Cold War by the US military for precise positions of ballistic missiles and other strategic military needs
   2. By auto manufactures as a luxury feature for their vehicles
   3. Soon after the first Iraq war (1990) by the Department of Defense as a system to help locate potential bombing targets
   4. By a partnership between the US government and private companies, including cell phone companies and Google
2. How many satellites does a GPS unit need to acquire for it to fully work (including elevation)?
   1. 2
   2. 3
   3. 4
   4. 5

**Short Answer:** Use the space provided to work out the solution if needed. Put your final answer in the line or space provided. You may use a basic or scientific calculator (but NOT a phone or graphing calculator). Show your work. (4 points each)

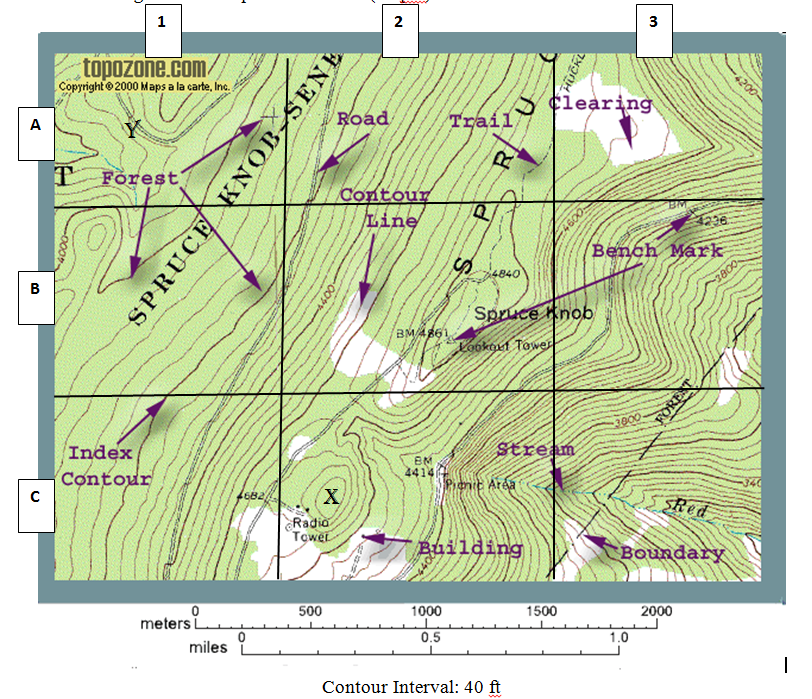
1. On a map with a scale of 1:24,000, a measured distance of 2 inches represents an actual

distance of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ feet.

1. On a map with a scale of 1:100,000, a measured distance of 8.5 centimeters represents an actual distance of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ kilometers. (4 points)
2. Someone you know is interested in attaining an Environmental Impact Assessment.
   1. Describe to them the main purpose of conducting one. Who would conduct one and why?
   2. Give at least 3 examples of what may be examined in an EIA.
3. Describe 3 reasons for conducting a forest inventory.
4. Describe 3 reasons why the UTM system is easy to use and understand.
5. Differentiate between qualitative and quantitative research or data, using at least three attributes of each.
6. Compare and contrast in-depth interviews, focus groups, and surveys in terms of the kinds of information each would attain for the researcher.

**Problem sets:** Answer each question or set of questions as completely as you can. Make sure to show all of your work, and write clear and direct answers.

Use this image to answer questions below. (2 points each)



1. In square C1, what is the aspect of the slope of the northwest quarter?
2. Which of the square would have the steepest slopes? A2, C1, C3?
3. What is the elevation of the building in C2 (an arrow is pointing to the building)?
4. What direction (N, S, E, or W) does the stream generally flow in square C3?
5. If you were to walk in a straight line from the X in square C2 to the Y in square A1…
6. How many meters would you walk?
7. Would you be walking mostly uphill or downhill?

You’re conducting an EIA and using a Leopold matrix. At the job site, you notice that the previous vegetation was half grass (i.e., a weedy, old planted lawn) and half was relatively undisturbed desert with lots of native plants. In preparing the site for construction, the crews removed all of the grass from the half of the site where it was growing. Then you see that they are cutting down one of the 5 saguaro cactuses from the other half of the site. You can’t help but see that the saguaro, as it falls, was nearly 40 feet tall (!), had three branches, and probably 5 nesting cavities for the rare pygmy owl.

1. Fill out this section of your Leopold matrix based on these observations. (4 points)

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Actions** | | |
| **Environmental Conditions** | **Description: Figure 4** | Alteration of Ground Cover | Modification of habitat |
| Native desert plants |  |  |
| Native desert animals |  |  |
| Existing groundcover |  |  |

1. Describe your reasoning for these values in terms of your observations at the job site.

(8 points)

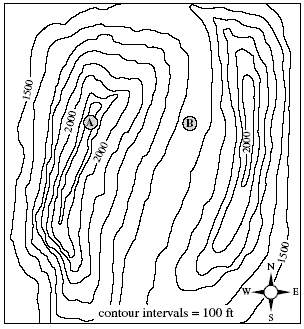
1. Plot sampling of a forest:

NOTE: Basal area of a tree is calculated as, Basal area (cm2): **πr**2,

where **π = 3.1415** and **r = 0.5\*diameter.**

* 1. Determine the basal area in m2 for the following diameters at breast height (DBH)
     1. 18 cm [6 points]
     2. 29cm
     3. 42 cm
  2. The three trees above were all that you measured on a 0.05 (1/20) hectare plot. Please provide the stand density for that plot in terms of : (6 points)
     1. Basal area per hectare:
     2. Trees per hectare:

Use the map below to answer questions below.

****

A’

A

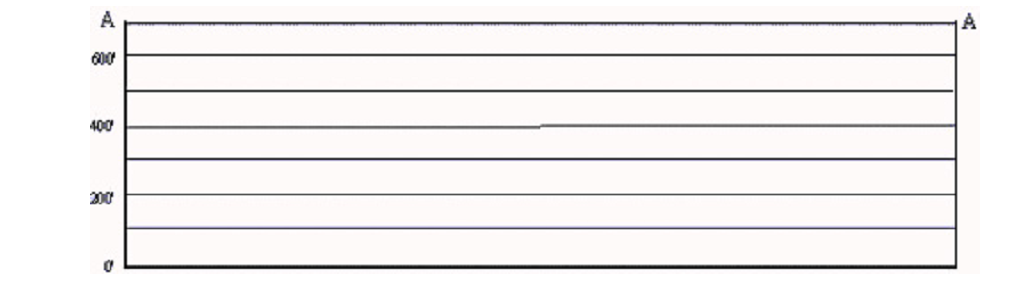
Scale bar:

1000 ft

Y

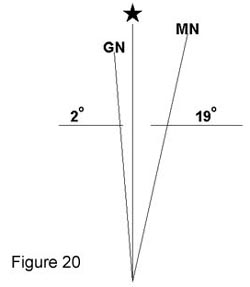
X

1. Construct a topographic profile along transect A-A’ using the graph below**. Make sure to label all axes!** (6 points)



1. If you were going to walk from point X to point Y and assuming it is exactly 1000 feet horizontal distance, what is the slope of the hill (in percentage) you would have to climb? (4 points)

You’re looking a topo map and find the image below on the bottom of the map.



1. What is the compass declination of this map? (2 points)
2. You need to use the map to navigate between two points. On the map, you measured an azimuth of 100° from one point to the other. If you have cheapo compass that cannot be pre-adjusted for declination, what magnetic azimuth must you follow in order to walk the line you measured on the map? (4 points)



45°

1. In the image above, how tall is the tree (image not to scale)? (2 points)