**GEOG303: Field Study in Environmental Geography**

**Assignment 2: Topographic Maps**

**Preliminary map scale questions: no map required**

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

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

2. On a map with a scale of 1:62,500, a measured distance of 5.5 inches represents an actual

distance of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ miles.

3. On a map with a scale of 1:250,000, a measured distance of 5.5 inches represents an actual

distance of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ miles.

4. On a map with a scale of 1:24,000, a measured distance of one centimeter represents an

actual distance of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ kilometers.

5. On a map with a scale of 1:50,000, a measured distance of 7.5 centimeters represents an

actual distance of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ kilometers.

6. You are traveling to a new place, say, Borneo. What scale map would you use to find your way around the island roads? – Small-scale or large-scale map? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Then, once you are in Borneo, what scale map would you use to plan a hike? – Small-scale or

large-scale map? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Use the map provided to answer the following questions.**

***Map Basics***

7. What is the name, state/county, series and year of production of the map?

8. What are the latitude and longitude coordinates for the corners of the map?

SE

SW

NE

NW

9. What is the name of the adjacent topographic map due north of this map?

10. What was the magnetic declination of the map at the time of its production?

11. What is the representative fraction scale and contour interval of the map?

***Direction***

12. If your compass reads 245º without accounting for declination for a direction you wish to travel, what direction (in azimuthal degrees) are you facing with respect to true north?

13. What direction (in azimuthal degrees) does Leopold Point lie from the towers on Mt. Bigelow?

***Location***

14. What feature lies at the following UTM coordinates: 0524200E, 3584080N

15. Give the UTM coordinates for the Δ symbol on top of Mt. Bigelow.

16. What is the dominant type of land cover for the following parcels:

a. SW1/4, NE1/4, NW1/4, Sec. 14, T11S, R16E

b. NE1/4, SE1/4, SE1/4, Sec. 21, T11S, R16E

17. Give the land survey designation (down to the 10 acre plot level – as above) for Chimney Spring (located near the eastern edge of the map).

***Distance and Area***

18. If you measure 5cm on the map, how many cm does this represent on the ground?

19. Give the straight line distances between the following (be reasonably precise – to the nearest tenth):

a. From the Δ on Mt Bigelow to Alder Box Spring (in Sec. 22, T11S, R16E) in miles.

b. From Pigeon water tank (Sec. 17, T11S, R16E) to Araster Spring (Sec. 36, T11S, R16E) in kilometers.

20. On your class field trip to Mt. Lemmon you have been left behind by the class at the picnic area near Syke Knob (western edge of map Sec. 31, T11S, R16E). You know the next stop for the class will be at San Pedro Vista to the SE. How many miles by road must you walk to catch up with rest of the class? (This is not a straight line measurement).

21. Approximate the area in acres of the reservoir in Sec. 14, T11S, R16E.

***Elevation***

22. Give the elevations at the following UTM coordinates:

a. 0534400E, 3593200N

b. 0526800E, 3591150N

23. Find the elevation marker (X) on Green Mountain (UTM 0529400E, 3584080N) and the road located to the NW.

a. If you were to hike from this marker to the road located to the NW, would you be hiking uphill or downhill?

b. What type of road is this?

c. What is the aspect of the slope you have just hiked (general directions will do – NE, NW, S, etc.)?

d. Calculate the percent grade of the slope between the X and the road.

***Map usage and interpretation***

24. Find the creek just east (~ 1500 ft) of Kellogg Mt. (located SE of Mt Bigelow).

a. What type of creek is this (or how often does it have water) and in what canyon does it lie?

b. Give the direction in azimuthal degrees of the flow of the creek for its first half mile.

c. Measure the length of the creek from its source to the edge of the map to the nearest tenth of a mile (use the string to measure accurately the major curves).

25. Follow the directions! Give the aspect of the slope and name the feature located at the end of the following trek:

a. Begin here: UTM 0526000E, 3585950N

b. Travel 1700 @ 330º

c. Travel 3000 @ 47º

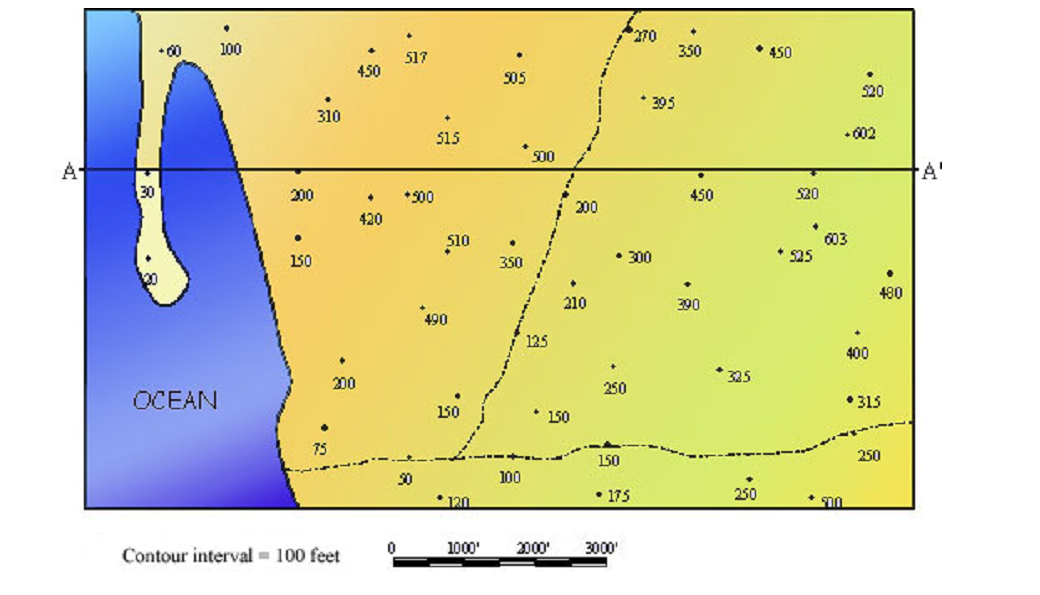
d. Travel 4100m @ 310º

**For questions 26 through 34 each person will be working on his or her own. This part is not a group assignment.**

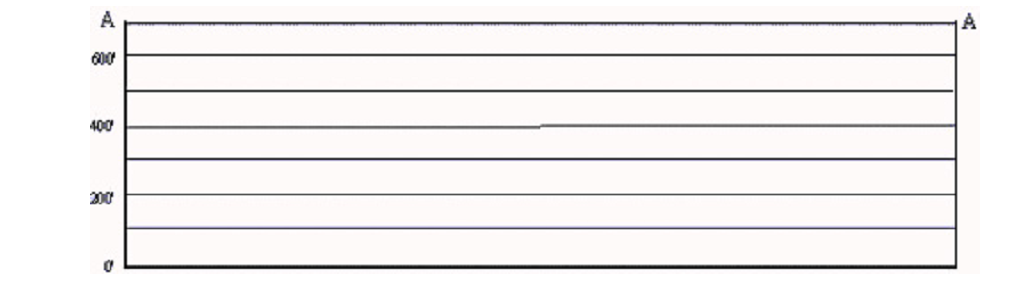
26. If you could purchase 1 km² anywhere on the Mt. Bigelow quadrangle to open a ski area for Tucsonans to enjoy (snow making machines can be included), where would you choose to build? Give the UTM coordinates for the four corners of the plot you select and **explain** **why** you think your chosen plot will make a good ski area.  ***Write your own answer, do not copy your group members.***

27. On the map below, interpolate the contour lines relative to the known elevations and existing

contour lines. Interpolate every 100 feet. Be sure to label your contour lines!



28. Construct a topographic profile along transect A-A’ using the graph below.



29. Indicate the location of (1) the stream and (2) the ocean in the topographic profile above.

30. Mark the appropriate distances on your horizontal axis.

31. Label both axes of your topographic profile. Hint: your topographic profile shows how

elevation changes over distance (from A to A’).

32. Calculate the vertical exaggeration of your profile:

(a) Horizontal scale: 1 in = \_\_\_\_\_\_\_\_\_\_\_\_\_\_ ft

(b) Vertical scale: 1 in = \_\_\_\_\_\_\_\_\_\_\_\_\_\_ ft

(c) Vertical Exaggeration = Horizontal scale / Vertical scale = \_\_\_\_\_\_\_\_\_\_\_\_\_\_ x

33. If you had to hike along transect A-A’, from the coastline to the N-S-flowing stream, you

would have hike up and down a ‘hill.’

- Calculate the western slope of the hill (%) from the coastline to the top of the hill.

Vertical relief (rise) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Horizontal distance (run) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Slope (rise/run\*100) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ %

- Calculate the eastern slope of the hill (%) from the top of the hill to the stream.

Vertical relief (rise) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Horizontal distance (run) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Slope (rise/run\*100) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ %

34. If you wanted to hike from the intersection of coastline and transect to the intersection of

transect and N-S-flowing stream, but you were interested in minimizing elevational

differences rather than the horizontal distance as in #33, which way would you go?

- Provide a brief description of your route. ***Do not copy your group members- write your own description.***

- Using a color pencil, indicate the route in your contour map.