



# Butte County Fire Department

## Basic Land Navigation Verification Sheet

I \_\_\_\_\_ verify that

Print Supervisor's name

\_\_\_\_\_ has completed the

Print Employee's name

**Basic Land Navigation** self study guide on

\_\_\_\_\_.

Date

Attached you will find the chapter review questions.

\_\_\_\_\_  
Supervisor's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Employee's Signature

\_\_\_\_\_  
Date

## Checking Your Understanding

Answers to “Checking Your Understanding” can be found in Appendix B.

1. List three examples of how you may use a map on an incident.
  
  
  
  
  
  
  
  
  
  
2. Describe two key points to remember when using a map with a compass or GPS receiver.
  
  
  
  
  
  
  
  
  
  
3. Indicate the type of map that would be most appropriate for these activities:
  - A. Locate hot spots on an incident – \_\_\_\_\_
  - B. Determine slope of a specific area – \_\_\_\_\_
  - C. Identify travel route – \_\_\_\_\_
  - D. Determine current perimeter location – \_\_\_\_\_
  - E. Identify perimeter location when the incident started – \_\_\_\_\_
  
4. What publication can you use to learn the ICS symbols?
  
  
  
  
  
  
  
  
  
  
5. List three sources of where you can obtain maps.

## Checking Your Understanding

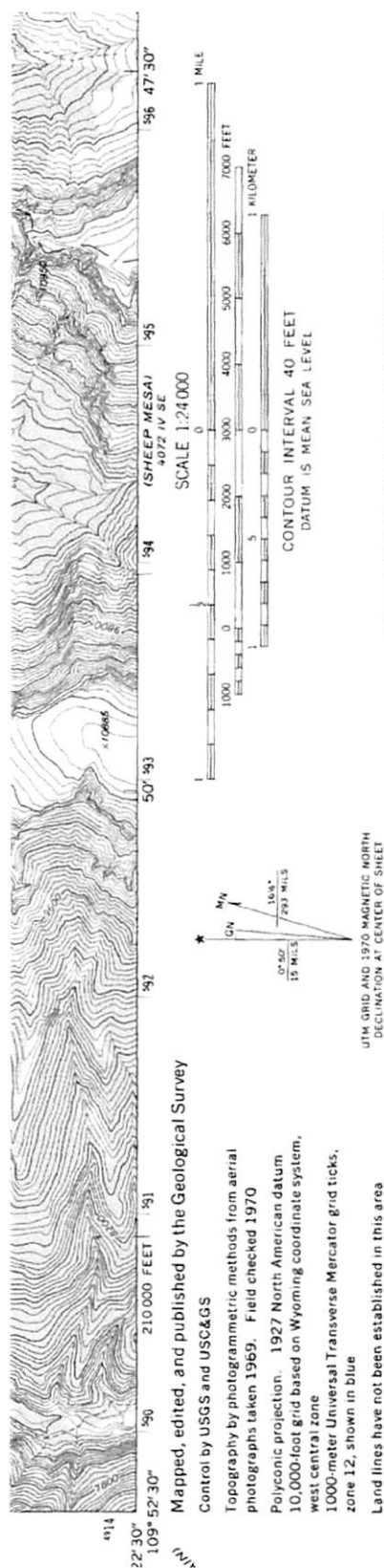
Answers to “Checking Your Understanding” can be found in Appendix B.

1. What is the fractional scale and declination of this map? If you are using a GPS receiver, what datum would you use?

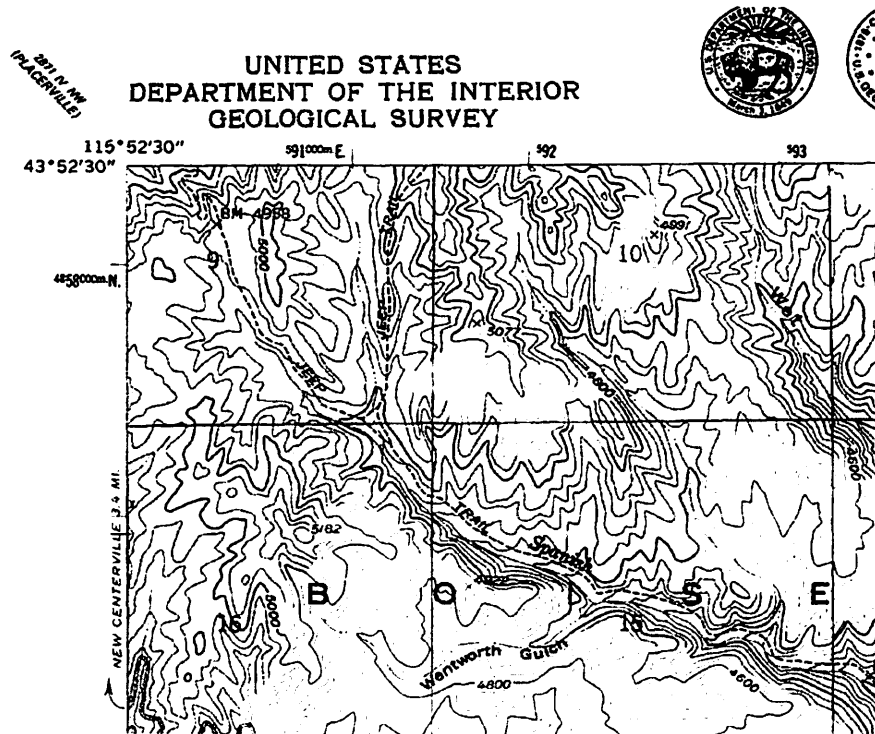
Fractional scale: \_\_\_\_\_

Declination: \_\_\_\_\_

Datum: \_\_\_\_\_



2. List the reference coordinates for latitude/longitude and UTM.

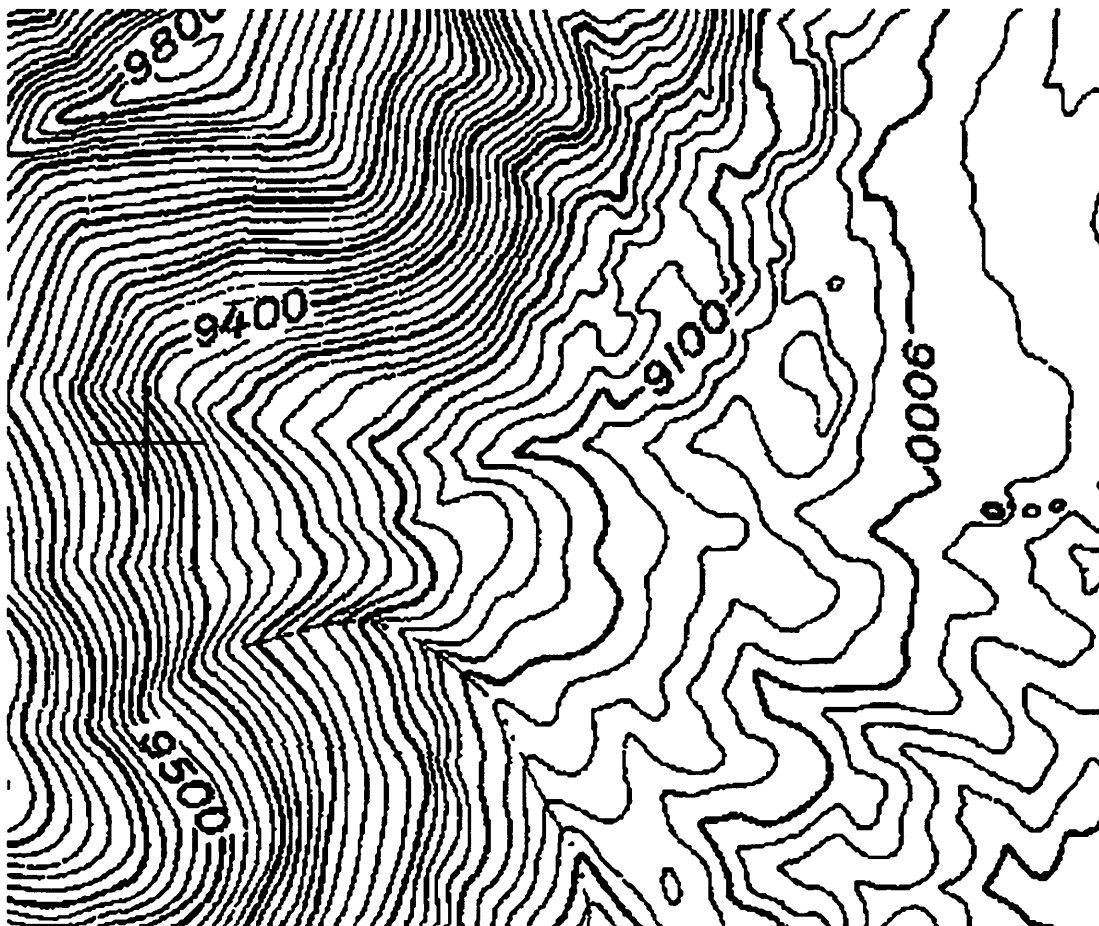


Reference coordinates latitude: \_\_\_\_\_

Reference coordinates longitude: \_\_\_\_\_

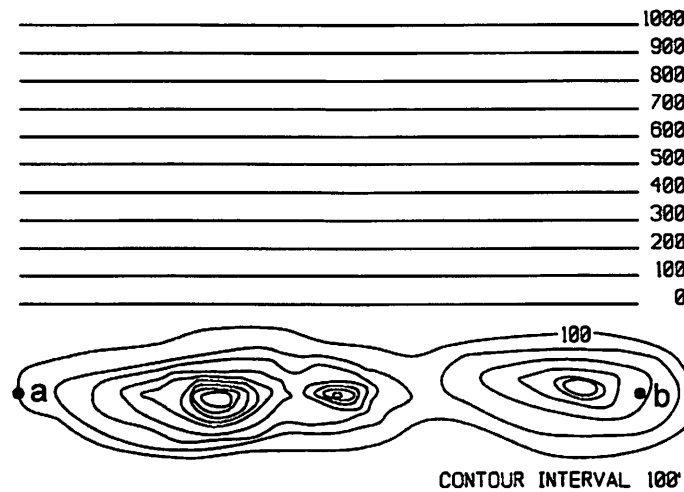
Reference coordinates UTM: \_\_\_\_\_

3. Calculate the contour interval for this map.



Contour interval: \_\_\_\_\_

4. Draw a profile (similar to a line graph) of the land from point “a” to point “b.” Elevation lines are marked in 100-foot increments. Hint: The elevation rises from the 100-foot contour line.



5. Use the map on the next page to identify the topographic feature inside the rectangles lettered A - F with one of these characteristics: stream, hilltop, steep terrain, ridge, depression, and flat terrain.

A. \_\_\_\_\_

B. \_\_\_\_\_

C. \_\_\_\_\_

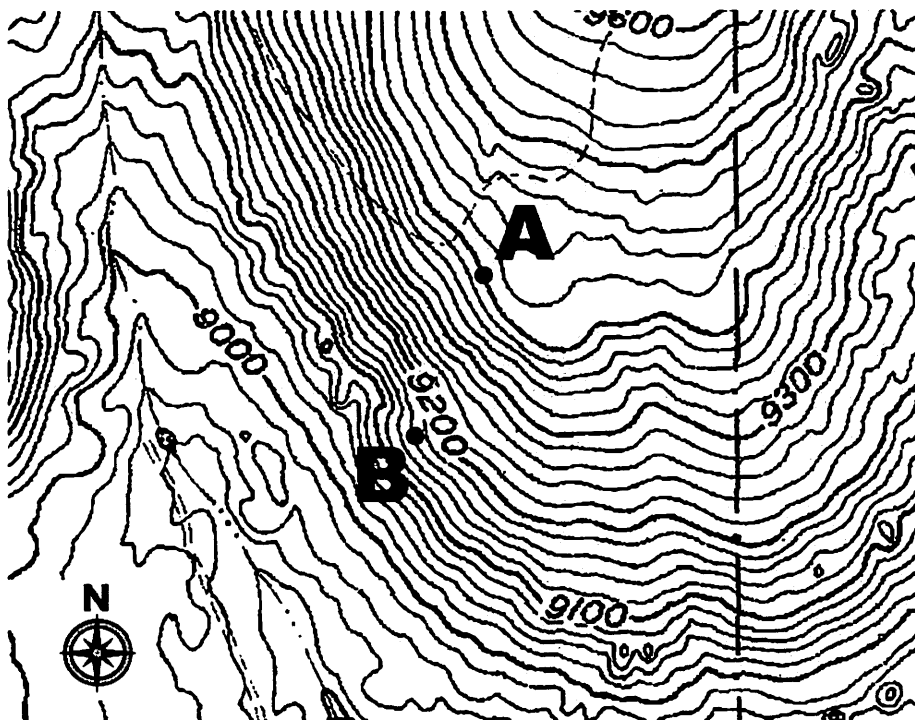
D. \_\_\_\_\_

E. \_\_\_\_\_

F. \_\_\_\_\_



6. Estimate the percent slope between A and B. What is the aspect of the slope between A and B? The scale is 1:24,000 (1 inch = 2000 feet).



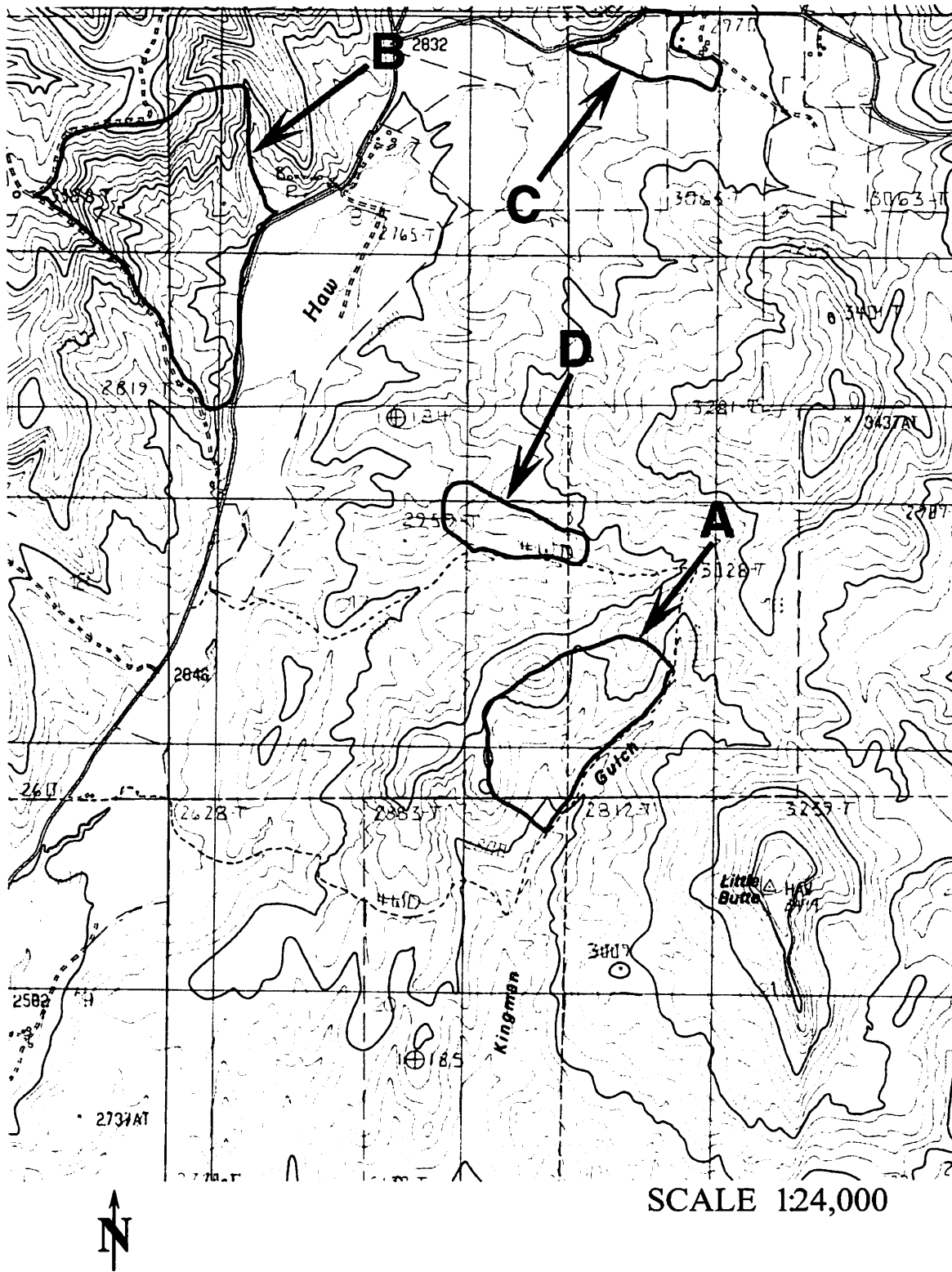
Slope: \_\_\_\_\_ Aspect: \_\_\_\_\_

7. Determine the equivalent unit of measurement for the following:

- A. 2.5 miles = \_\_\_\_\_ chains  
 B. 1.5 chains = \_\_\_\_\_ yards  
 C. 29,040 feet = \_\_\_\_\_ miles  
 D. 3 chains x 20 chains = \_\_\_\_\_ acres  
 E. 1/8 of a section = \_\_\_\_\_ acres

8. Use the map on the next page to estimate the acreage (in acres) within 10% accuracy (+ or -) of fires A - D.

- A. \_\_\_\_\_  
 B. \_\_\_\_\_  
 C. \_\_\_\_\_  
 D. \_\_\_\_\_

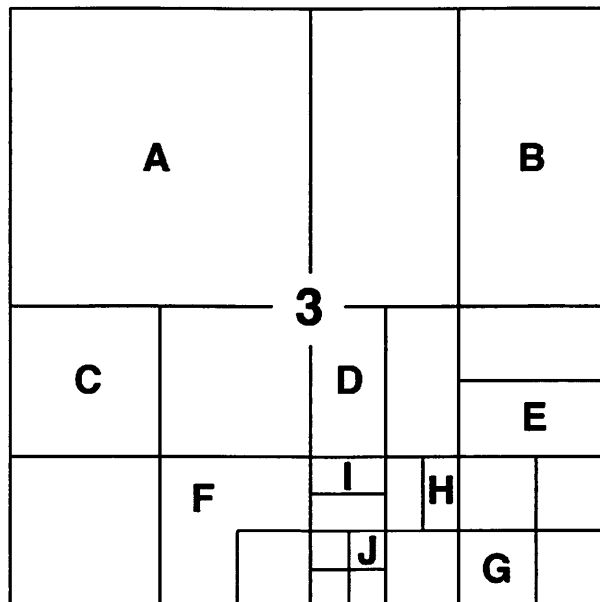


## Checking Your Understanding

Answers to “Checking Your Understanding” can be found in Appendix B.

1. What are two common global coordinate systems used in the United States?
2. Latitude is a measure of how far \_\_\_\_\_ or \_\_\_\_\_ a point is from the \_\_\_\_\_.  
Longitude is a measure of how far \_\_\_\_\_ or \_\_\_\_\_ a point is from the \_\_\_\_\_.
3. On USGS topographic maps, UTM grid lines are marked every \_\_\_\_\_ meters.
4. This is an abbreviated UTM coordinate: <sup>5</sup>66E and <sup>51</sup>96N. How else could it be written?
5. Given this UTM position in Montana – 12 683456E 5346782N – the easting is located \_\_\_\_\_ meters east of the 12th zone central meridian and the northing is located \_\_\_\_\_ meters north of the 12th zone equator.

6. Write the acreage and location description (section, township and range) for each of the lettered areas.



**Section 3, Township 2 South, Range 4 E**

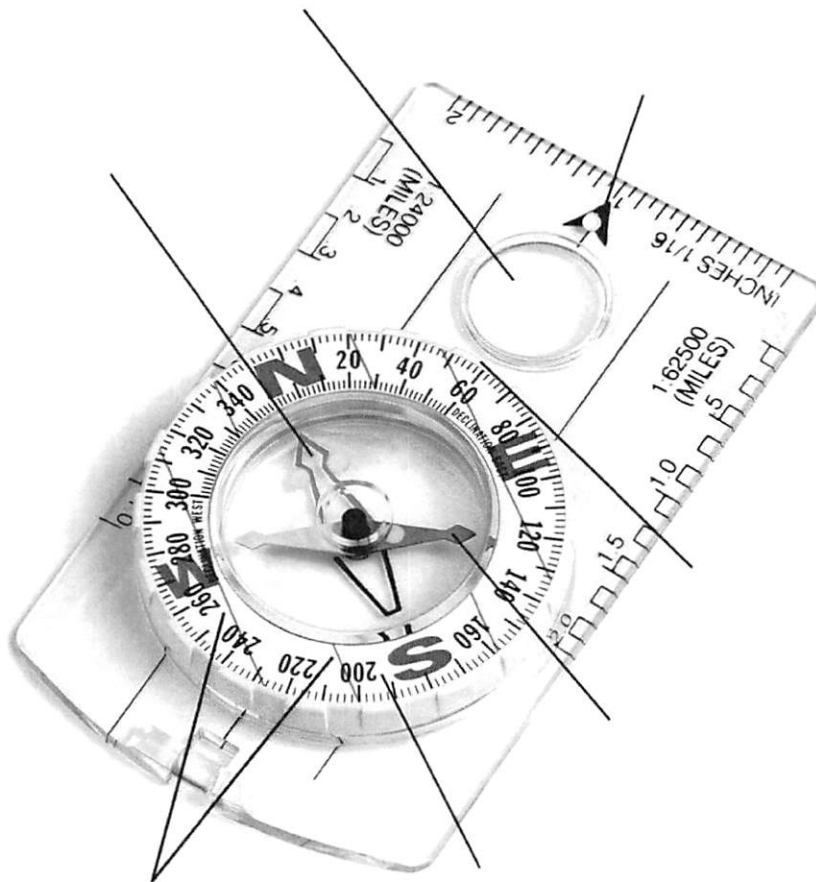
- A. Acres: \_\_\_\_\_ Location Description: \_\_\_\_\_
- B. Acres: \_\_\_\_\_ Location Description: \_\_\_\_\_
- C. Acres: \_\_\_\_\_ Location Description: \_\_\_\_\_
- D. Acres: \_\_\_\_\_ Location Description: \_\_\_\_\_
- E. Acres: \_\_\_\_\_ Location Description: \_\_\_\_\_
- F. Acres: \_\_\_\_\_ Location Description: \_\_\_\_\_
- G. Acres: \_\_\_\_\_ Location Description: \_\_\_\_\_
- H. Acres: \_\_\_\_\_ Location Description: \_\_\_\_\_
- I. Acres: \_\_\_\_\_ Location Description: \_\_\_\_\_
- J. Acres: \_\_\_\_\_ Location Description: \_\_\_\_\_

7. Name two other Geographic Location Systems besides latitude/longitude, UTM, and U.S. Public Land Survey.

## Checking Your Understanding

Answers to “Checking Your Understanding” can be found in Appendix B.

1. List three examples of how you may use a compass on an incident.
2. Label the seven parts of a compass.



3. List five tips on how to obtain accurate compass readings.
  
  
  
  
  
  
  
  
  
  
4. How do you adjust your compass for declination? How do you know what the declination is for the area where you are working?
  
  
  
  
  
  
  
  
  
  
5. What are the two different ways to orient a compass?
  
  
  
  
  
  
  
  
  
  
6. The following exercises will improve your performance.
  - Practice taking direct bearings and back bearings of various objects.
  
  - Take a compass bearing of a distant object. Mark your starting location, walk to your object. Now take a back bearing and follow that bearing. How far off were you from your starting point?
  
  - Practice estimating slope using a clinometer.

## Checking Your Understanding

Answers to “Checking Your Understanding” can be found in Appendix B.

1. Practice storing and naming waypoints and tracks using a GPS receiver.
2. Determine how many waypoints your GPS receiver can store in the memory.
3. List three ways you can prevent making user mistakes when using a GPS receiver.
4. List three things that are important to do when you are taking a GPS receiver with you on an incident.
5. How should you name waypoints?

## Checking Your Understanding

Answers to “Checking Your Understanding” can be found in Appendix B.

1. Practice orienting a map with topographic features and with a compass.

**Refer to the map on page 141 to answer questions 2 – 6.**

2. Using a protractor or compass, what is the bearing between point A and B?

3. What is the latitude/longitude coordinate of point C?

Latitude \_\_\_\_\_ Longitude \_\_\_\_\_

1. What is the UTM coordinate of point C? The UTM zone is 11.

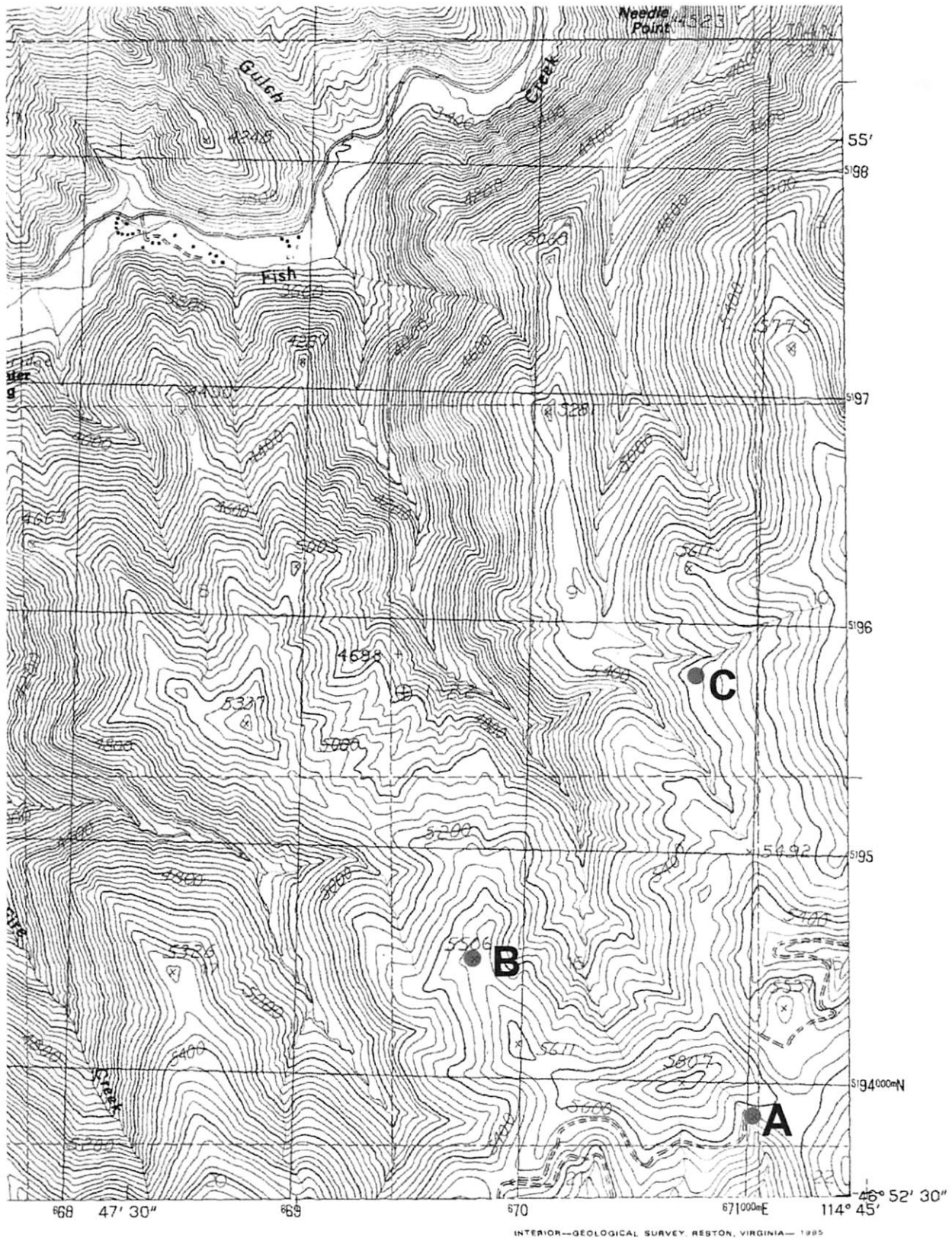
Easting \_\_\_\_\_ Northing \_\_\_\_\_

2. Plot the following latitude/longitude coordinate on the map:

Latitude  $46^{\circ} 53' 47''$  Longitude  $114^{\circ} 46' 33''$

3. Plot the following UTM coordinate on the map:

Zone 11 Easting 668760 Northing 5195520



4. When estimating your own position using triangulation, can you take bearings of a tree and large rock for drawing lines of position?
5. You are a field observer on an incident. You see a potential hot spot several miles away and you need to radio in the location but you do not know the hot spot's location. How can you find out the location of the hot spot using a compass?
6. Follow the directions in this chapter and determine your pace on level and sloping ground.
7. If your average pace is  $5\frac{1}{2}$  feet and you walk 1700 paces on level ground, how many feet did you travel?
8. In general, list three situations that could lengthen or shorten your pace.
9. What are the four standards that you should incorporate when preparing field maps?
10. Why is determining the memory capacity of your GPS receiver important?
11. What information should be in your field notes?