

Name: \_\_\_\_\_

FO-4313/6313 Spatial Technologies for Forest Resource Management  
**Third Hour Exam, 2003**

Formulas:

$$RF = \frac{1}{S} = \frac{d}{D} = \frac{f}{(H-h)}$$

1. Define Scale: \_\_\_\_\_  
\_\_\_\_\_ (5)
2. The two distinguishing characteristics of a RF are:
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_ (5)
3. The scale of an aerial image where an object measures 0.05 inches on the image and 22.86 meters on the ground is:  
\_\_\_\_\_ (10)
4. If the scale of an aerial image taken with a camera of focal length 152.4 mm is 1:20,000 at mean sea level (m.s.l.), the scale of the image at 3,000 ft above m.s.l. would be:  
\_\_\_\_\_ (10)
5. After printing a draft of your GIS map using ARC/View, you see that the scale bar is not a standard scale bar with 1 inch graduations and you wish to compute a Representative Fraction for the graphic scale bar. If one graduation on the scale bar is 45/60 inches in length and this graduation represents 1,028.7 **meters** on the ground, the computed RF is 1: \_\_\_\_\_ (10)
6. If the scale of an aerial image taken with a camera of focal length 76.2 mm is 1:12,000 at mean sea level (m.s.l.), the on-the-ground dimensions of a building located at 2,000 ft elevation that measures 10.8/60 inches by 14.4/60 inches on the image are:  
\_\_\_\_\_ ft by \_\_\_\_\_ ft (10)

7. On 7.5 minute quadrangle sheet that has a RF of 1:24,000, the Y scale is 458/60 inches per 2.5 minutes of latitude change and X scale is 382/60 inches per 2.5 minutes of longitude change on the lower 1/3 of the quad sheet. If you draw a rectangle in that portion of the quad sheet that is 1 minute Latitude by 1 minute Longitude, the rectangle will have the dimensions of:

\_\_\_\_\_ miles (3 decimal places) Latitude by  
\_\_\_\_\_ miles (3 decimal places) Longitude. (10)

8. On the quad sheet described in Question 7 above, a square that is 1,000 meters per side would have the map dimensions of:

\_\_\_\_\_ inches (3 decimal places) by  
\_\_\_\_\_ inches (3 decimal places). (10)

9. The UTM coordinates of Points 1 and 2 are:

Point 1: 324,000.000m E & 3,625,000.000m N

Point 2: 329,000.000m E & 3,616,339.740m N

- a. The straight line distance between Points 1 and 2 is: \_\_\_\_\_ meters (5)
- b. The true bearing from Point 1 to Point 2 would be: \_\_\_\_\_ (5)
10. You have received a new set of aerial photographs, but do not know the scale of these photographs. In an attempt to determine photographic scale, you measure the distance between two identifiable road intersections on the aerial photo as 180/60 inches and the corresponding distance on a 7.5 minute quad sheet as 9,900 feet, **assuming both intersections are at the same elevation**. The scale of the photograph is calculated to be:

a. R.F. = 1: \_\_\_\_\_

b. 1 inch = \_\_\_\_\_ feet

c. 1 inch = \_\_\_\_\_ chains

d. 1 square inch = \_\_\_\_\_ acres

e. 1 square centimeter = \_\_\_\_\_ hectares (20)