Name: _____

EXAM 1-06
FO-3015 Forest Description and Analysis

SHOW CALCULATIONS OR NO CREDIT WILL BE GIVEN

1. If you have paced from the NW corner of the NW 1/4 to the SE corner of the NW 1/4 of a standard G.L.O. section (i.e. 640 acre square) in 679 paces,

   a) Your average number of paces per chain is _____. (3)

   b) The average length of one pace, in feet, is _____. (3)

2. Given a **magnetic azimuth** of 195^{o} in an area with a magnetic declination of 5^{o}W:

   The equivalent True bearing is _____ (3)

3. Given a **magnetic bearing** of S30^{o}E in an area with a magnetic declination of 2^{o}E:

   The equivalent True bearing is _____. (4)

4. The length of one side of a square 40 acre tract under the GLO Survey system is:

   _____ meters. (4)

5. If the scale of your **7.5** minute quad sheet is **1:24,000** and the distance between two road intersections is measured to be 79.2/60 inches:

   a) The distance is measured to be approximately _____ chains, which (3)

   b) Translates to be approximately _____ miles. (3)

6. Your clinometer had a double error of -8.8 ft at a distance of 110 ft. when checked with the **peg method**. Using your clinometer with the **percent (i.e. 100 ft.) scale**, calculate the true/adjusted height of each tree below using the distance and clinometer readings supplied and the known error adjustment.

a) computed percent error of the clinometer is: _____ %

b) distance from tree = 1.80 chains
reading to top tree = +45
reading to tree base = -5
Corrected total tree height = _____ ft (5)

c) distance from tree = 1.0 chain
reading to top of tree = +70
reading to base of tree= + 5
Corrected total tree height = _____ ft (5)

7. If you tally 8 trees on a 1/20 (0.05) acre plot, this represents:

_____ trees per acre (5)

8. On a recent BAF **20** cruise, you tallied the following trees on a single point.

DBH	**#Trees**	**Vol per Tree**
16	3	100 bd. ft
18	2	150 bd. ft
20	1	200 bd. ft

Compute a per acre stand and stock table that also includes basal area : (2 decimals) (12)

A. The best estimate of mean volume per acre is _____ bd. ft per acre. (5)

B. The best estimate of mean basal area per acre is _____ sq. ft per acre. (5)

C. The average (i.e. quadratic mean) dbh of the tally was _____ inches. (5)

9. You wish to calculate the UTM coordinates of the intersection of Dorman Lake Road and

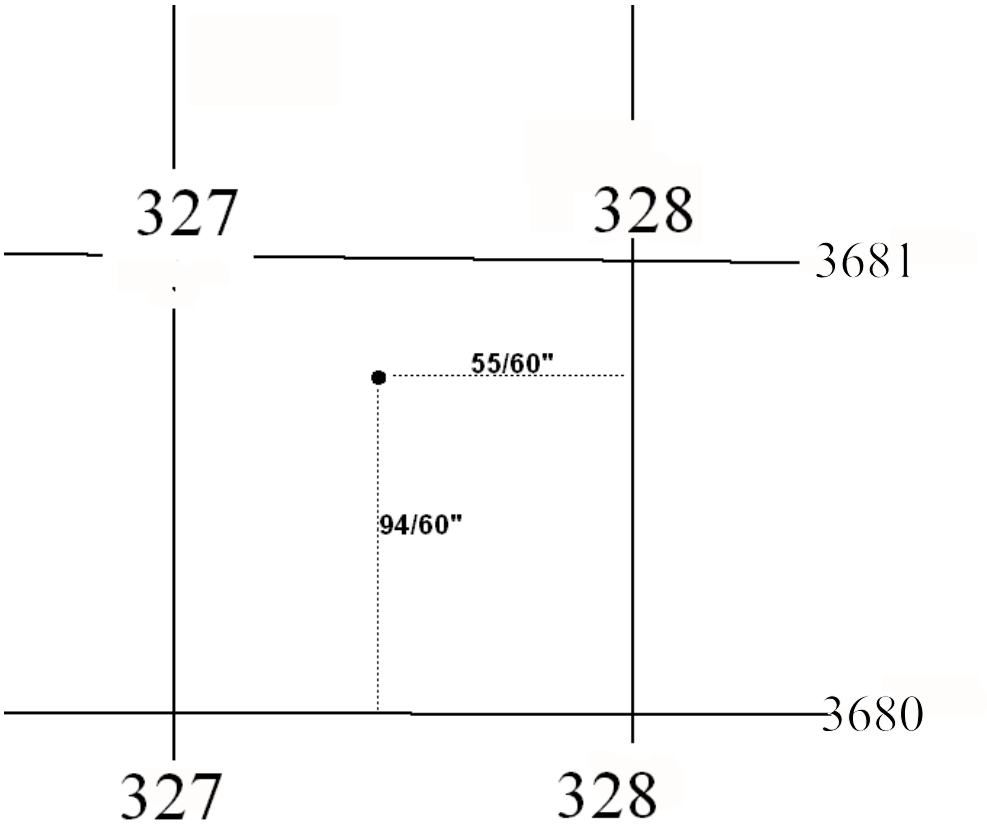
Highway 25. Using the Bradley 7.5 minute quad sheet (scale of 1:24,000), you calculate the location to be: **(see Figure below)**

55/60 inches <u>west</u> of the 328,000 m E grid line
94/60 inches <u>north</u> of the 3,680,000 m N grid line in Zone 16N.

Thus, the UTM coordinates of the road intersection are calculated to be:

_____ m East (5)

_____ m North, Zone 16N (5)



10. Complete the following traverse table using the pictures of the compass readings below (nearest 10^0) and perform the required computations:

(15)

Course	BEARING	Distance (ft)	Latitude	Departure
1		100	50.0	
2		100		17.4
3		100	-76.6	
4		130		-44.5
	Totals:			

Course 1

Course 2

Course 3

Course 4

A. The computed closure distance is: _____ (5)

B. The computed precision of this surveyed traverse is: _____ (5)

Statistical Formulas

$$s^2 = \frac{\sum_{k=1}^{n} x_i^2 - \frac{\left(\sum_{k=1}^{n} x_i\right)^2}{n}}{n-1}$$

$$s_{\bar{x}} = \sqrt{\frac{s^2}{n}\left(1-\frac{n}{N}\right)}$$

$$SE\% = \left(\frac{t_{n-1,\alpha} s_{\bar{x}}}{\bar{x}}\right) * 100\%$$

$$\bar{x} \pm (t_{n-1,\alpha}) s_{\bar{x}}$$

$$CV\% = \frac{\sqrt{s^2}}{\bar{x}} * (100\%)$$

$$PACF = \frac{BAF}{tree\ ba} \qquad tree\ ba = 0.005454\,(D^2)$$

$$PACF = \frac{1}{plot\ size} \qquad plot\ size = \frac{tree\ ba}{BAF}$$

Latitude = (Course length)Cos(Bearing angle) {N = + , S = -}

Departure = (Course length)Sin(Bearing angle) {E =+, W= _}

$$closure\ error = \sqrt{(departures)^2 + (latitudes)^2}$$

Precision = 1: (total course length)/(error closure)