

Name: _____

EXAM 1-05
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 SW 1/4 to the NW corner of the SE 1/4 of a standard G.L.O. section (i.e. 640 acre square) in 480 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 **true azimuth** of 195° in an area with a magnetic declination of 5°W :
The equivalent Magnetic bearing is _____ (3)

3. Given a **true bearing** of $S30^\circ\text{E}$ in an area with a magnetic declination of 2°E :
The equivalent Magnetic bearing is _____. (3)

4. Suppose you chained a total distance of 423 chains around your traverse and the error of closure was $N46.48^\circ\text{E}$ a distance of 70.5 links
Your horizontal precision is computed to be 1 in _____ ? (4)

5. If you obtain a length measurement of 73.2 links on a 2-chain Gunter tape, the length is:
_____ chains. (4)

6. 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)

7. A tree that is 95 feet in total height has a merchantable height of 3.5- 16.0 ft. logs to an 8.0 inch top, a $DBH_{ob} = 14.5$ inches and a $DBH_{ib} = 13.3$ inches. The diameters at the top of the first 16.0 ft. log measure 12.1 inches, d.o.b., and 11.0 inches, d.i.b.

The Mesavage and Girard Form Class of this tree is calculated to be _____ (3)

8. Your clinometer had a double error of +6.4 ft at a distance of 80 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) distance from tree = 1.80 chains
 reading to top tree = +45
 reading to tree base = -5

total tree height = _____ ft (5)

- b) distance from tree = 1.0 chain
 reading to top of tree = +70
 reading to base of tree = + 5

total tree height = _____ ft (5)

9. During the Basic Tree Exercise you measured the heights of 10 sample trees (shown below) and computed the precision statistics to be:

a. Mean height = _____ (5)

b. Standard deviation of mean height = _____ (5)

c. Standard error of mean height = _____ (5)

d. Sampling Error (95% Confidence Limit) as percent of mean height = _____ (5)

Tree#	Height	Height ²
1	78	6084
2	65	4225
3	79	6241
4	89	7921
5	59	3481
6	66	4356
7	77	5929
8	87	7569
9	89	7921
10	76	5776
Sums	765	59,503

10. A. If you tally 8 trees on a $1/5$ (0.2) acre plot, how many trees per acre does this represent? _____ trees per acre (4)

B. If you tally 8 trees on a $1/4$ (0.25) acre plot, how many trees per acre does this represent? _____ trees per acre (3)

11. On a recent BAF10 cruise, you tallied the following trees on a single point. Compute and complete a per-acre stand and stock table, with basal area and totals, for the prism point:

DBH	#Trees	Vol per Tree	_____	_____	_____	_____
16	10	100 bd. ft				
18	5	150 bd. ft				
20	2	200 bd. ft				

Computed a per acre stand and stock table with basal area : (2 decimal places) (12)

A. The best estimate of mean volume per acre is _____ bd. ft per acre. (4)

B. The best estimate of mean basal area per acre is _____ sq. ft per acre. (4)

C. The average (i.e. quadratic mean) dbh of the tally was _____ inches. (4)

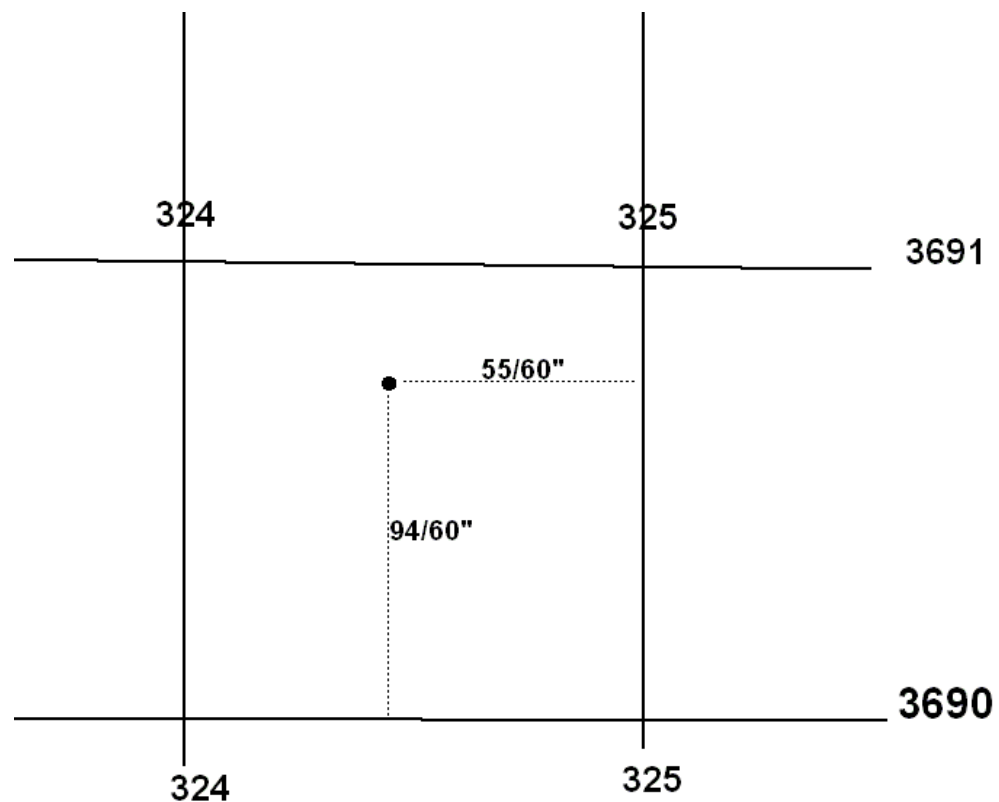
12. You wish to calculate the UTM coordinates of the intersection of Dorman Lake Road and Highway 25. Using the Bradley 7.5 minute quad sheet (scale of 1:24,000), you calculate the location to be: **(see Figure below)**

55/60 inches west of the 325,000 m E grid line
 94/60 inches north of the 3,690,000 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)



**Bonus: 5
 all or none.**

points;

If the UTM grid coordinates of the NW corner of a square tract are:

325,042.00 m E

3,689,456.00 m N

and the coordinates of the SE corner of the same tract are:

325,444.336 m E

3,689,053.664 m N

the tract contains _____ acres.

Statistical Formulas

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

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

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

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

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

$$PACF = \frac{BAF}{tree\ ba}$$

$$tree\ ba = 0.005454 (D^2)$$

$$PACF = \frac{1}{plot\ size}$$

$$plot\ size = \frac{tree\ ba}{BAF}$$

Student's t-Table
Forest Description and Analysis

The Distribution of Probability

<u>df</u>	<u>0.5</u>	<u>0.4</u>	<u>0.3</u>	<u>0.2</u>	<u>0.1</u>	<u>0.05</u>	<u>0.02</u>	<u>0.01</u>	<u>0.001</u>
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.619
2	0.819	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.598
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.941
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.856
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.405
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	0.697	0.876	1.088	1.363	1.769	2.201	2.718	3.106	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.767
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
60	0.679	0.848	1.046	1.296	1.671	2.000	2.390	2.660	3.460
120	0.677	0.845	1.041	1.289	1.658	1.980	2.358	2.617	3.373
∞	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291