

Answers to Additional Questions
Forest Measurements
Sixth Edition

CHAPTER 1: INTRODUCTION

1. a. 0.1058 km
b. 259.01 ha
c. 59.57 km²
d. 9.62 m³
2. a. 20,997.4 ft
b. 168.03 acres
c. 1,942.31 ft³
d. 8,046.21 ft³ per acre
3. 0.001 or 1/1000
4. a. Diameter at breast height
b. Basal area
c. Thousand board feet
d. Global positioning system

CHAPTER 2: STATISTICAL METHODS

1. a. 39.46
b. 39.75
c. 29.9
d. 64.8
e. 8.05
2. a. 210 (combination)
b. 5,040 (permutation)
3. Mean $\bar{X} = 20$
Variance $S^2 = 25$
4. 72

CHAPTER 3: LAND MEASUREMENTS

1. a. 12 ft 11 inches
b. 312 ft 2.16 inches
c. 82.4 acres
2. a. N80°E
b. N86°E
c. S3°E
d. S89°W
3. 7,854 mph
4. False

CHAPTER 4: CUBIC VOLUME, CORD MEASURE, AND WEIGHT SCALING

1. 32 ft³
2. a. 230.47 ft³
b. 66.93 ft³
c. 136.18 ft³
3. a. 0.136
b. 0.349
c. 0.785
d. 2.182
4. 0.497

CHAPTER 5: LOG RULES, SCALING PRACTICES, AND SPECIALTY WOOD PRODUCTS

1. 1,059.74 ft²
2.

	Scribner	Doyle	International ¼-in.
a.	25.3	9	28.8
b.	59.8	36	64.8
c.	278.8	256	288.8
d.	907.3	961	924.8
3. International log rule
4. True

CHAPTER 6: MEASURING STANDING TREES

1. Mean basal area: 0.324 ft²
 Arithmetic mean diameter: 7.37 in
 Quadratic mean diameter: 7.71 in

2.

	Crown Surface Area	Crown Volume
a.	481.3 ft ²	1,119.2 ft ³
b.	359.1 ft ²	530.1 ft ³

3. False

4.

One-inch classes:	Two-inch classes:
10	10
6	6
9	8
9	8

CHAPTER 7: VOLUMES AND WEIGHTS OF STANDING TREES

1. a. 225.56 kg
 b. 130.99 kg
 c. 34.95 kg
 d. 35.97 kg
 e. 18.19 kg
2. Local volume equations are based on the single variable of dbh, whereas standard volume equations are based on additional terms of height and taper. One is not necessarily superior to the other.
3. Advantage: Homogeneity of variance
 Disadvantage: Regression line passes through mean of *logarithm* of dependent variable
4. Negative

CHAPTER 8: SAMPLING DESIGNS

1. a. Class 1, 12 plots; Class 2, 17 plots; Class 3, 21 plots; then randomly locate each plot within each cover type
b. Locate plots randomly across the total land area and hope to get representation of all classes proportional to size
2. b. Near one
3. 6.7
4. 482

CHAPTER 9: FOREST INVENTORY

1. 2,833 bd ft
2. A stand table is a tabulation of total number of stems in a stand by dbh classes and species. A stock table is a listing of the total volume of stems in a stand by dbh classes and species.
3. False
4. Stump height

CHAPTER 10: GEOSPATIAL INFORMATION

1. Large-scale photography (e.g., 1:3,000) is taken relatively closer to the ground when compared to small-scale photography (e.g., 1:100,000).
2. a. The scale should be consistent in the coastal plain because of the relatively level ground being photographed.
b. The scale would probably not be consistent in the highlands because of the mountainous terrain and rapid changes in elevation.
3. a. Film type
b. Photographic scale
c. Season when photo was taken
4. 1:50,000
5. An absolute location is taken with respect to the Earth as a whole, whereas a relative location is taken with respect to some other place or location.

6. A positional error is one where the coordinates of the map differ from the true geographical coordinates. A classification error is when a point or polygon is not identified correctly.
7. Vector
8.
 - a. Positional
 - b. Boundary
 - c. Classification

CHAPTER 11: INVENTORIES WITH SAMPLE STRIPS OR PLOTS

1. Move the plot center until the entire plot is in the area being sampled.
Utilize the mirage method to account for boundary overlap.
2. Area sampled: 20.7 acres
Total tract area: 207 acres
3. Staked-point method
4. 2.5 percent; expansion factor 40

CHAPTER 12: INVENTORIES WITH POINT SAMPLES

1. Basal area per acre: 80 ft² per acre
Trees per acre: 111.12 (using 2-inch dbh classes)
107.47 (using actual dbh observed)
2. False
3. False
4. No

CHAPTER 13: INVENTORIES WITH 3P SAMPLING

1. Selection, measurement, and computation.
2. $n_e = 289$
3.
 - a. 67
 - b. 47
4. False

CHAPTER 14: SITE, STOCKING, AND STAND DENSITY

1. 36 age measurements would be required
2. Relative spacing is defined as the average distance between trees divided by the average height of the dominants. Crown competition factor is defined as a reflection of the area available to the average tree in a stand in relation to the maximum area the tree could utilize if it was open grown. They are both measures of stand density.
3. 0.20
4. $-3/2$

CHAPTER 15: TREE-GROWTH AND STAND-TABLE PROJECTION

1. Annual volume growth rate: 16.75% or 3.17 ft³ per year
2. Uneven-aged, low density, and immature timber stands.
3. 18.43 cu ft
4. False

CHAPTER 16: GROWTH AND YIELD MODELS

1. Pure, even-aged stands exhibit diameter distributions that are unimodal and slightly skewed. Regular, uneven-aged stands have diameter distributions with an inverse J shape that is highly skewed.
2.
 - a. Reliability of estimates
 - b. Flexibility
 - c. Detail for decision making
 - d. Efficiency in application
3. Location
4.
 - a. Diameter 0.14 in., height 2.58 ft
 - b. 0.41 in.

CHAPTER 17: ASSESSING FOREST CARBON

1. 120 pounds
2. Oceans and forests