**Forestry CDE**

**Purpose**

The purpose of the Forestry Career Development Event is to stimulate student interest and to promote forestry instruction in the agricultural education curriculum. By participating in this event, students gain an understanding of the economic impact of the forest environment and the forestry industry, while recognizing environmental and social factors affecting the management of forests.

**Superintendent**

The superintendent for this event is Mr. Andy VonCanon, Western Region Agricultural Education Coordinator, Mountain Horticulture Crops Research and Extension Center, 455 Research Drive, Mills River, NC 28759, Phone: 828-553-6296 Fax: 828-684-8715 Email: andy\_voncanon@ncsu.edu

**Eligibility**

This event is open to all FFA chapters and FFA members in good standing. FFA Members may not participate in a Career Development Event that leads to a state level event after July 1, following their high school/early college graduation. Members winning a previous state event in this area or that have participated in a previous national event in the area are ineligible.

The top three teams in the federation are eligible to participate in the regional event unless modified by the region. The top three individuals in the federation event are eligible to participate in the regional event as individuals regardless of their team placing. The top three individuals in the regional event are eligible to participate in the state event as individuals regardless of their team placing.

The appropriate numbers of teams based on event participation from each region are eligible to compete in the state career development event. The top three individuals in the regional event are eligible to participate in the state event as individuals regardless of their team placing. Teams and individuals advancing to state event participation must be certified by the regional FFA advisor. Teams shall consist of three or four members. Four scores will count towards the team total (A three-member team will earn a zero for the 4th score). No alternates are allowed in the state events. Any alternate found participating in a state event will result in a team disqualification.

The use or possession of cellular phones or any other mobile electronic communication device is prohibited during any state-level career development event. Any violation of this rule by any team member will result in total team disqualification.

The North Carolina FFA Association, in keeping with the FFA mission and purposes, does not permit the use of tobacco products, e-cigarettes, vapes, or Juuls at any FFA facility or at any FFA activity.

FFA members and advisors may not visit the site of the state career development event within seven days of the start of the event. Teams that violate this rule will be disqualified. Any member found cheating in any state-level career development event will result in total team disqualification for that event.

At the North Carolina FFA State Convention, participation in more than one FFA CDE event is permitted as long as events are not being held concurrently and no special provisions are required to facilitate participation with the exception that parliamentary procedure and public speaking and parliamentary procedure and Creed speaking which are held concurrently will allow dual participation and special provisions for flighting.

In compliance with the Americans with Disabilities Act, North Carolina FFA will honor requests for reasonable accommodations made by individuals with disabilities. Please direct accommodation requests through the CDE/LDE Accommodation Request [Form](https://docs.google.com/forms/d/e/1FAIpQLSfp7skRSm9Ses9Sztzoao85hckEE11LLSoXI7vtOlZlzwoyYQ/viewform?usp=sf_link). If the accommodation can be made for all and/or doesn’t provide an unfair advantage, then every effort will be made to provide the accommodation. Requests can be accommodated more effectively if notice is provided at least 10 days before the event.

**Middle School Participation**

Middle school students and teams may participate in any Career Development Event or Leadership Development Event. The top three middle school participants will be recognized at the State FFA Convention. Middle school participants should designate during registration.

**Dress Code**

Participants are required to follow the North Carolina FFA Career Development Event Dress Code. Participants are allowed to wear long pants, an appropriate shirt with a collar or an appropriate high school or FFA t-shirt.

The North Carolina FFA Association strives to promote a positive image at all Official FFA Events. The dress code policy was established to address the issue of appropriate attire at all Official FFA Events. Members should adhere to this policy for all events. A ten percent reduction will be applied to all individual scores from a chapter if a participant from that chapter violates the dress code during that career event.

**Procedures for Administering the Event**

The event will consist of four sections, with each member of the team participating in all sections. No two members of any one team will participate in the same section at the same time.

Each section of the event will have a maximum time limit of thirty (30) minutes, requiring orderly movement of all participants in sequence from the section that they were assigned at the beginning.

Participants are expected to bring the following items:

* Tree Scale Stick (Biltmore Stick)
* Clipboard
* Pencil
* Handheld Calculator
* Compass

No additional equipment or tools are allowed for use.

FFA members participating in career development events that require the use of calculators may only use nonprogrammable/graphing calculators that do not have the ability to communicate with other calculators. Calculators will be screened prior to the start of a CDE for acceptability. Students caught using data stored on a calculator or communicating with other calculators will result in a total team disqualification for the event.

**Part 1: Timber Cruising for Board Volume (Saw Timber)**

Each participant will provide his or her own scale stick. Calipers, diameter tapes or other measuring instruments will not be allowed at the federation, regional, or state level.

The official saw timber tally card is based on the International 1/4 inch Rule Form Class 78 and is included in the supplemental material on subsequent pages. Estimates will be made to the nearest half log (eight feet) of merchantable timber and to inch diameter classes on each tree recorded. The cutoff point at the top of the tree will be a minimum diameter of eight inches (8”) or at the point where merchantability stops due to limbs or other defects. Tree heights can exceed 4 logs.

Standing trees will be tagged with numbers. The total board feet of each tree will be computed and recorded but only the total volume determined by the participant will be graded.

The tally sheet will be turned in to the designated official at the end of the thirty (30) minute time period. The total possible points for this section will be 100 points. One point will be deducted for each 10 board feet of variance from the total volume as determined by the event officials.

Minimums: DBH 10 inches, 1” diameter classes

Top Diameter: 8”

Log Height 16’; Round to the nearest ½ log

**Part 2: Orienteering Practicum**

Each participant will pace the marked property lines of a simulated tract of timber. They will use a hand compass to determine the Azimuth reading and pacing to determine the distance between property markers. Participants will begin at a starting point and record the distance and Azimuth reading to the next point on the scorecard. Each distance measurement and Azimuth reading is worth 10 points. One half of a point (0.5) will be deducted for each degree and each foot the participant is off the correct answer. There will be a total of five lengths measured as property lines. A maximum of 10 points can be deducted from each answer. Total possible points for this section will be 100 points.

**Part 3: Tree Identification**

Each participant will identify 20 trees. Trees common to the area should be used for local and

federation events, but at the regional and state level, any of the trees on the official list can be used. A

tree species may be used more than once if necessary. Trees will be numbered 1 to 20. Participants are

to write the appropriate number in the correct space on the tree identification answer sheet. The total

possible points for this section will be 100 points. Five 5 points will be deducted for each incorrect answer.

**Part 4: Forestry Equipment Identification**

Each participant will identify 20 tools from the approved equipment list. Each tool is worth 5 points. The total possible points for this section will be 100 points.

**Scoring**

*Maximum Score 400*

Timber Cruising (Saw Timber) 100

Orienteering Practicum 100

Tree Identification 100

Equipment Identification 100

**Procedure for Determining the State Event Winner When Scores are Tied**

In the event a tie score exists, apply the following methods in sequential order until the tie is broken:

1. Compare the total team scores for the tree identification component and the higher scoring team is the winner.

2. Compare the total team scores for the equipment identification component and the higher scoring team is the winner.

3. Compare the total team score for the saw timber component and the higher scoring team is the winner.

4. Compare the total team score for the orienteering practicum component and the higher scoring team is the winner.

5. If these methods fail to break the tie, co-winners will be declared, and a run-off event will be held to determine which team will represent North Carolina at the National FFA Convention. The run-off event will follow the same rules as the state event.

Special Note: In the event a tie exists between first, second or third place teams on the regional level,

the tied teams will be allowed to participate in the state event. In the event a tie exists in a federation

event that sends teams directly to state competition, the tied teams will be allowed to participate in the

state event.

**Procedure to Determine the High Scoring Individual When Scores are Tied**

In the event a tie score exists, apply the following methods in sequential order until the tie is broken:

1. Compare the individual scores for the tree identification component and the higher scoring contestant is the winner.

2. Compare the individual scores for the equipment identification component and the higher scoring contestant is the winner.

3. Compare the individual score for the saw timber component and the higher scoring contestant is the winner.

4. Compare the individual score for the orienteering practicum component and the higher scoring contestant is the winner.

5. If these methods fail to break the tie, co-winners will be declared.

**State Awards**

The awards will be presented annually at the state FFA convention and will include team 1st, 2nd and 3rd place plaque and a travel monetary award. The high scoring individual will be recognized at the state FFA convention.

**National Career Development Event Participation**

State winning teams advancing to the national career development event will be automatically registered for the national event. It is the responsibility of the FFA Chapter Advisor to complete all necessary national certification and waiver forms and return them to the state FFA Coordinator by the assigned due date.

State winning CDE teams that choose not to participate at the national level should contact the state office by Sept 1 prior to National Convention. Teams that fail to inform the state office prior to Sept 1 will be ineligible to participate in that same CDE for the next year (chapters may appeal to the State FFA Board of Directors). Teams that do not compete at the National Convention will be required to pay back the travel award.

TREE MEASUREMENT-TIMBER CRUISING FOR BOARD VOLUME

(SAWTIMBER ESTIMATION) Tree Measurement-Timber Cruising

FORESTRY CAREER DEVELOPMENT EVENT for Board Volume Tally Sheet

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tree Diameter | | Gross Volume of Tree, International 1/4 Inch Rule  Form Class 78  Volume (Board Feet) by Number of Usable 16 Foot Logs | | | | | | | | | | | | | |
|  | 1 | | | 1.5 | 2 | | 2.5 | 3 | | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 |
| 10 | 36 | | | 48 | 59 | | 66 | 73 | |  |  |  |  |  |  |
| 11 | 46 | | | 61 | 76 | | 88 | 96 | |  |  |  |  |  |  |
| 12 | 56 | | | 74 | 92 | | 106 | 120 | | 128 | 137 |  |  |  |  |
| 13 | 67 | | | 90 | 112 | | 130 | 147 | | 158 | 168 |  |  |  |  |
| 14 | 78 | | | 105 | 132 | | 153 | 174 | | 187 | 200 |  |  |  |  |
| 15 | 92 | | | 124 | 156 | | 182 | 206 | | 225 | 242 |  |  |  |  |
| 16 | 106 | | | 143 | 180 | | 210 | 241 | | 263 | 285 |  |  |  |  |
| 17 | 121 | | | 164 | 206 | | 242 | 278 | | 304 | 330 |  |  |  |  |
| 18 | 136 | | | 184 | 233 | | 274 | 314 | | 344 | 374 |  |  |  |  |
| 19 | 154 | | | 209 | 264 | | 311 | 358 | | 392 | 427 |  |  |  |  |
| 20 | 171 | | | 234 | 296 | | 348 | 401 | | 440 | 480 | 511 | 542 |  |  |
| 21 | 191 | | | 262 | 332 | | 391 | 450 | | 496 | 542 | 579 | 616 |  |  |
| 22 | 211 | | | 290 | 368 | | 434 | 500 | | 552 | 603 | 647 | 691 |  |  |
| 23 | 231 | | | 318 | 404 | | 478 | 552 | | 608 | 663 | 714 | 766 |  |  |
| 24 | 251 | | | 346 | 441 | | 523 | 605 | | 664 | 723 | 782 | 840 |  |  |
| 25 | 275 | | | 380 | 484 | | 574 | 665 | | 732 | 800 | 865 | 930 |  |  |
| 26 | 299 | | | 414 | 528 | | 626 | 725 | | 801 | 877 | 949 | 1021 |  |  |
| 27 | 323 | | | 448 | 572 | | 680 | 788 | | 870 | 952 | 1032 | 1111 |  |  |
| 28 | 347 | | | 482 | 616 | | 733 | 850 | | 938 | 1027 | 1114 | 1201 | 1280 | 1358 |
| 29 | 375 | | | 521 | 667 | | 794 | 920 | | 1016 | 1112 | 1210 | 1308 | 1398 | 1488 |
| 30 | 403 | | | 560 | 718 | | 854 | 991 | | 1094 | 1198 | 1306 | 1415 | 1517 | 1619 |
| 31 | 432 | | | 602 | 772 | | 921 | 1070 | | 1184 | 1299 | 1412 | 1526 | 1640 | 1754 |
| 32 | 462 | | | 644 | 826 | | 988 | 1149 | | 1274 | 1400 | 1518 | 1637 | 1762 | 1888 |
| 33 | 492 | | | 686 | 880 | | 1053 | 1226 | | 1360 | 1495 | 1622 | 1750 | 1888 | 2026 |
| 34 | 521 | | | 728 | 934 | | 1119 | 1304 | | 1447 | 1590 | 1727 | 1864 | 2014 | 2163 |
| 5 | 555 | | | 776 | 998 | | 1196 | 1394 | | 1548 | 1702 | 1851 | 2000 | 2156 | 2312 |
| 36 | 589 | | | 826 | 1063 | | 1274 | 1485 | | 1650 | 1814 | 1974 | 2135 | 2298 | 2461 |
| 37 | 622 | | | 873 | 1124 | | 1351 | 1578 | | 1752 | 1926 | 2099 | 2272 | 2444 | 2616 |
| 38 | 656 | | | 921 | 1186 | | 1428 | 1670 | | 1854 | 2038 | 2224 | 2410 | 2590 | 2771 |
| 39 | 694 | | | 976 | 1258 | | 1514 | 1769 | | 1968 | 2166 | 2359 | 2552 | 2744 | 2937 |
| 40 | 731 | | | 1030 | 1329 | | 1598 | 1868 | | 2081 | 2294 | 2494 | 2693 | 2898 | 3103 |
| Tree Number | | | Diameter (Inches) | | | Number Logs | | | Volume Board Feet | | | | | | |
| 1 | | |  | | |  | | |  | | | | | | |
| 2 | | |  | | |  | | |  | | | | | | |
| 3 | | |  | | |  | | |  | | | | | | |
| 4 | | |  | | |  | | |  | | | | | | |
| 5 | | |  | | |  | | |  | | | | | | |
| 6 | | |  | | |  | | |  | | | | | | |
| 7 | | |  | | |  | | |  | | | | | | |
| 8 | | |  | | |  | | |  | | | | | | |
| 9 | | |  | | |  | | |  | | | | | | |
| 10 | | |  | | |  | | |  | | | | | | |
|  | | |  | | | Total Volume  Board Feet | | |  | | | | | | |

100 Point Total-One point deducted for each 10 BF of variance from the total volume as determined by officials.

Participant Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Number: \_\_\_\_\_\_\_\_\_

Chapter: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ SCORE \_\_\_\_\_\_\_\_\_\_\_\_

EQUIPMENT IDENTIFICATION

FORESTRY CAREER DEVELOPMENT EVENT

Instructions: Equipment will be numbered 1-20. The contestant is to write the appropriate number in the space to the left of the tool. Each correct answer is worth 5 points.

\_\_\_\_\_ Altimeter

\_\_\_\_\_ Back-pack Fire Pump

\_\_\_\_\_ Bark Gauge

\_\_\_\_\_ Canthook

\_\_\_\_\_ Carabiner

\_\_\_\_\_ Chainsaw

\_\_\_\_\_ Chainsaw Chaps

\_\_\_\_\_ Clinometer

\_\_\_\_\_ Data Recorder

\_\_\_\_\_ Densiometer

\_\_\_\_\_ Diameter Tape

\_\_\_\_\_ Drip Torch

\_\_\_\_\_ Dot Grid

\_\_\_\_\_ Felling wedge

\_\_\_\_\_ Fiberglass Measuring Tape

\_\_\_\_\_ Fire Rake

\_\_\_\_\_ Fire-Swatter

\_\_\_\_\_ Fire Weather Kit

\_\_\_\_\_ Flow/current Meter

\_\_\_\_\_ GPS Receiver

\_\_\_\_\_ Hand Compass

\_\_\_\_\_ Hand Lens/Field Microscope

\_\_\_\_\_ Hip Chain

\_\_\_\_\_ Hypo-Hatchet

\_\_\_\_\_ Increment Borer

\_\_\_\_\_ Log Rule

\_\_\_\_\_ Logger’s Tape

\_\_\_\_\_ Maul

\_\_\_\_\_ pH Meter

\_\_\_\_\_ Planimeter

\_\_\_\_\_ Plant Press

\_\_\_\_\_ Plastic Flagging

\_\_\_\_\_ Pole Saw

\_\_\_\_\_ Pruning Saw

\_\_\_\_\_ Pulaski Axe

\_\_\_\_\_ Relaskop

\_\_\_\_\_ Safety Glasses

\_\_\_\_\_ Safety Hard Hat

\_\_\_\_\_ Scale stick

\_\_\_\_\_ Secchi disc

\_\_\_\_\_ Soil Sampler

\_\_\_\_\_ Soil Test Kit

\_\_\_\_\_ Staff Compass

\_\_\_\_\_ Stereoscope

\_\_\_\_\_ Survey Instrument

\_\_\_\_\_ Tally Book

\_\_\_\_\_ Tally Meter

\_\_\_\_\_ Timber Tongs

\_\_\_\_\_ Tree Caliper

\_\_\_\_\_ Tree Marking Gun

\_\_\_\_\_ Tree Planting Hoe or Bar

\_\_\_\_\_ Water Sampler

\_\_\_\_\_ Water Test Kit

\_\_\_\_\_ Wedge Prism

\_\_\_\_\_ Wheeler Caliper

Participant Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Participant Number: \_\_\_\_\_\_\_\_\_\_\_

Chapter: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ SCORE: \_\_\_\_\_\_\_\_\_\_\_

## TREE IDENTIFICATION

FORESTRY CAREER DEVELOPMENT EVENT

The total possible points for this section will be one hundred (100) points. Each correct answer will be worth five (5) points.

\_\_\_\_\_\_\_\_\_\_ American Holly *(Ilex opaca)*

\_\_\_\_\_\_\_\_\_\_ Ash *(Fraxinus sp.)*

\_\_\_\_\_\_\_\_\_\_ Bald Cypress *(Taxodium distichum)*

\_\_\_\_\_\_\_\_\_\_Beech *(Fagus americana)*

\_\_\_\_\_\_\_\_\_\_ Birch *(Betula nigra)*

\_\_\_\_\_\_\_\_\_\_ Black Cherry *(Prunus serotina)*

\_\_\_\_\_\_\_\_\_\_ Blackgum *(Nyssa sylvatica)*

\_\_\_\_\_\_\_\_\_\_ Black Oak *(Quercus velutina)*

\_\_\_\_\_\_\_\_\_\_ Black Walnut *(Juglans nigra)*

\_\_\_\_\_\_\_\_\_\_ Chestnut Oak *(Quercus montana)*

\_\_\_\_\_\_\_\_\_\_ Cottonwood *(Populus deltoides)*

\_\_\_\_\_\_\_\_\_\_ Dogwood *(Cornus florida)*

\_\_\_\_\_\_\_\_\_\_ Elm *(Ulmus sp.)*

\_\_\_\_\_\_\_\_\_\_ Fraser Fir *(Abies fraseri)*

\_\_\_\_\_\_\_\_\_\_ Hemlock *(Tsuga canadensis)*

\_\_\_\_\_\_\_\_\_\_ Hickory *(Carya sp.)*

\_\_\_\_\_\_\_\_\_\_ Loblolly Pine *(Pinus taeda)*

\_\_\_\_\_\_\_\_\_\_ Locust (*Robinia pseudoacacia or Gleditsia triacanthos)*

\_\_\_\_\_\_\_\_\_\_ Longleaf Pine *(Pinus palustris)*

\_\_\_\_\_\_\_\_\_\_ Northern Red Oak *(Quercus rubra)*

\_\_\_\_\_\_\_\_\_\_ Pecan *(Carya illinoinensis)*

\_\_\_\_\_\_\_\_\_\_ Persimmon *(Diospyros virginiana*)

\_\_\_\_\_\_\_\_\_\_ Post Oak *(Quercus stellata)*

\_\_\_\_\_\_\_\_\_\_ Red Cedar *(Juniperus virginianna)*

\_\_\_\_\_\_\_\_\_\_ Red Maple *(Acer rubrum)*

\_\_\_\_\_\_\_\_\_\_ Redbud *(Cercis canadensis)*

\_\_\_\_\_\_\_\_\_\_ Shortleaf Pine *(Pinus echinata)*

\_\_\_\_\_\_\_\_\_\_ Sourwood *(Oxydendrum arboreum)*

\_\_\_\_\_\_\_\_\_\_ Southern Red Oak *(Quercus falcata)*

\_\_\_\_\_\_\_\_\_\_ Sugar Maple *(Acer saccharum)*

\_\_\_\_\_\_\_\_\_\_ Sweetgum *(Liquidambar styraciflua)*

\_\_\_\_\_\_\_\_\_\_ Sycamore (Platanus sp.)

\_\_\_\_\_\_\_\_\_\_ Virginia Pine (Pinus virginiana)

\_\_\_\_\_\_\_\_\_\_ Water Oak *(Quercus nigra)*

\_\_\_\_\_\_\_\_\_\_ White Oak *(Quercus alba)*

\_\_\_\_\_\_\_\_\_\_ White Pine *(Pinus strobus)*

\_\_\_\_\_\_\_\_\_\_ Willow Oak *(Quercus phellos)*

\_\_\_\_\_\_\_\_\_\_ Yellow Poplar *(Liriodendron tulipifera)*

Participant Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Participant Number: \_\_\_\_\_\_\_\_\_\_\_

Chapter: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ SCORE: \_\_\_\_\_\_\_\_\_\_\_\_

ORIENTEERING PRACTICUM

FORESTRY CAREER DEVELOPMENT EVENT

Instructions: The participant will use a hand compass and pacing to the nearest full foot to simulate the determination of the property lines on a tract of timber. Begin at THE starting mark and record the distance and Azimuth reading to the next mark. Each measurement is worth ten (10) points. One half of a point (0.5) will be deducted for each degree and each foot the participant is off the correct answer. A maximum of 10 points can be deducted for each answer.

**Distance in Feet** **Score** **Azimuth Reading** **Score**

1. Point A to Point B \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_
2. Point B to Point C \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_
3. Point C to Point D \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_
4. Point D to Point E \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_
5. Point E to Point A \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_

Total \_\_\_\_\_\_\_\_ Total \_\_\_\_\_\_\_\_

Total Score \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Participant Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Participant Number: \_\_\_\_\_\_\_\_\_\_

Chapter: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Sample of Orienteering Layout**

Point A X 99 degrees – 170 ft.

(Start & Finish)

X Point B

24 degrees-

62 ft.

170 degrees

125 ft.

X

Point E

291 degrees-

81 ft.

X Point C

Point D X 261 degrees – 64 ft.