



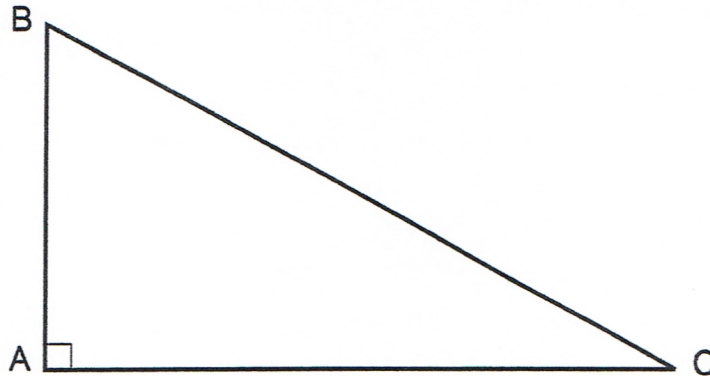
2010-2011

SAMPLE PROBLEMS

Sponsored by the National Society of Professional Surveyors

TRIG-STAR PROBLEM LOCAL CONTEST

PRINT NAME: _____

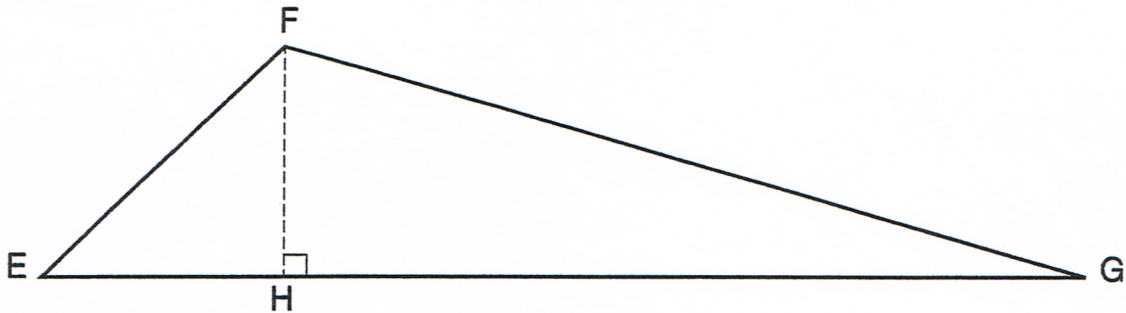


KNOWN: DISTANCE AB = 108.81 DISTANCE BC = 188.88

FIND: \sphericalangle CBA = _____ (5 POINTS)
 DISTANCE AC = _____ (5 POINTS)

REQUIRED ANSWER FORMAT
 DISTANCES: NEAREST HUNDREDTH
 ANGLES: DEGREES-MINUTES-SECONDS
 TO THE NEAREST SECOND

TRIG-STAR PROBLEM LOCAL CONTEST



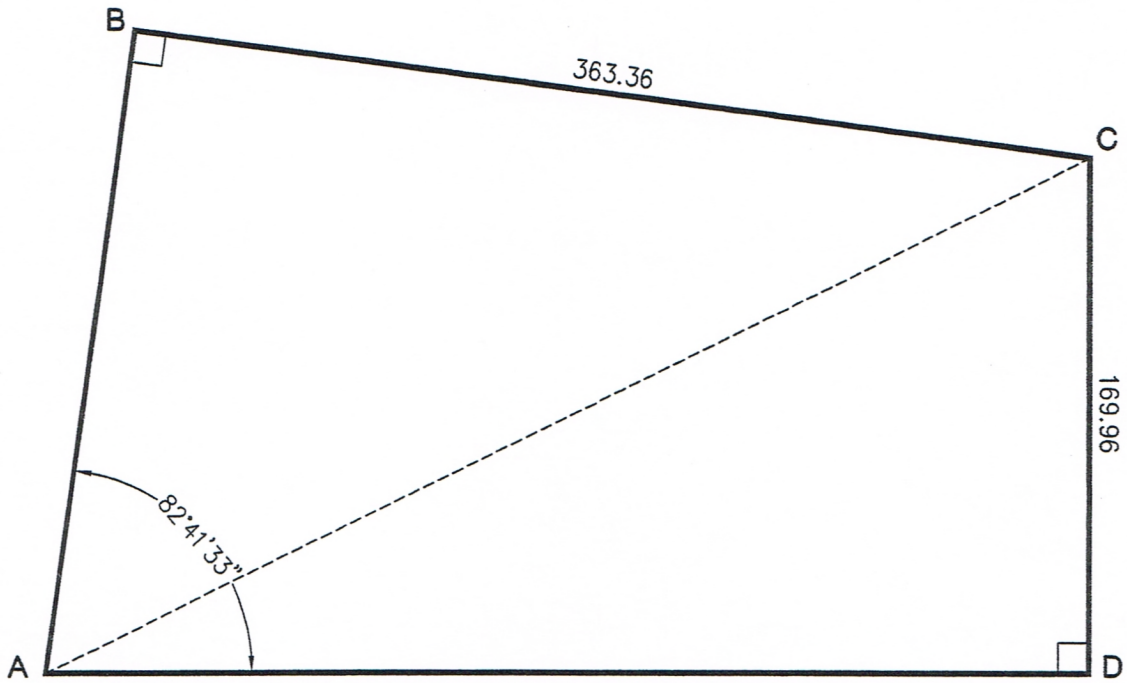
KNOWN: DISTANCE EF = 101.06 \sphericalangle EFG = 118°18'18" \sphericalangle FEG = 44°05'06"

FIND: \sphericalangle EGF = _____ (6 POINTS)
 DISTANCE EH = _____ (6 POINTS)
 DISTANCE FH = _____ (6 POINTS)
 DISTANCE FG = _____ (6 POINTS)
 DISTANCE GH = _____ (6 POINTS)

REQUIRED ANSWER FORMAT
 DISTANCES: NEAREST HUNDREDTH
 ANGLES: DEGREES-MINUTES-SECONDS
 TO THE NEAREST SECOND

PAGE TOTAL: _____ POINTS

TRIG-STAR PROBLEM LOCAL CONTEST



KNOWN: DISTANCE $BC = 363.36$ DISTANCE $CD = 169.96$
 $\angle BAD = 82^{\circ}41'33''$

FIND: DISTANCE $AB =$ _____ (10 POINTS)

DISTANCE $AD =$ _____ (10 POINTS)

DISTANCE $AC =$ _____ (10 POINTS)

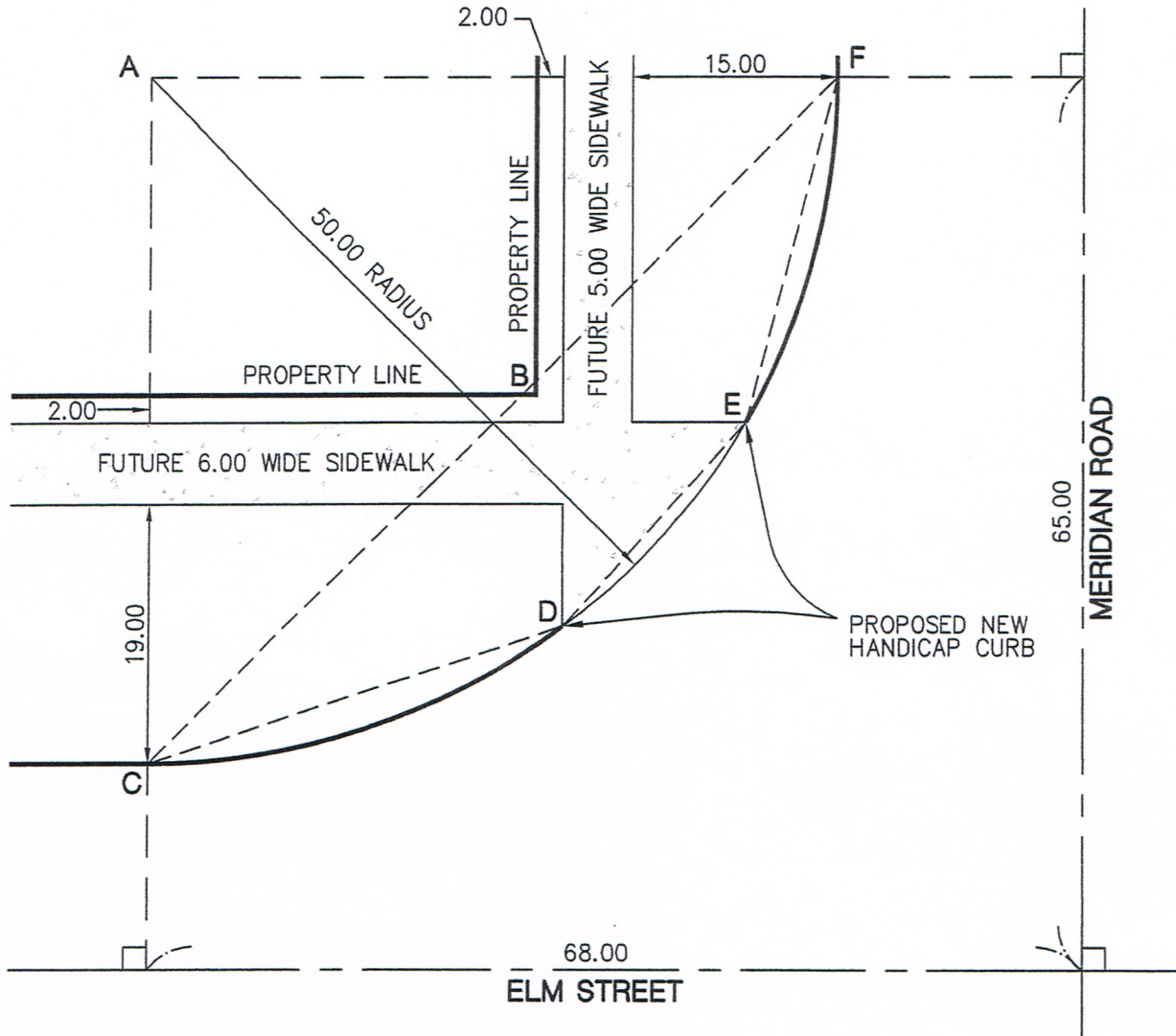
REQUIRED ANSWER FORMAT

DISTANCES: NEAREST HUNDREDTH

PAGE TOTAL: _____ POINTS

TRIG-STAR PROBLEM LOCAL CONTEST

A LOCAL SURVEYOR HAS BEEN ASKED TO STAKE OUT POINTS D AND E WHERE A FUTURE SIDEWALK WILL MEET A NEW HANDICAP CURB AT THE CORNER OF MERIDIAN ROAD AND ELM STREET. THE SURVEYOR ALREADY KNOWS THE LOCATION OF POINTS B, C AND F BUT MUST MAKE SOME CALCULATIONS TO ESTABLISH AND VERIFY THE POINTS NEEDED.



FIND:

DISTANCE AB = _____ (5 POINTS)

CHORD DISTANCE CD = _____ (5 POINTS)

CHORD DISTANCE DE = _____ (5 POINTS)

CHORD DISTANCE EF = _____ (5 POINTS)

CHORD DISTANCE CF = _____ (5 POINTS)

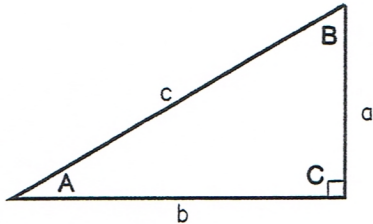
ARC DISTANCE CF = _____ (5 POINTS)

REQUIRED ANSWER FORMAT
DISTANCES: NEAREST HUNDREDTH

PAGE TOTAL: _____ POINTS

TRIG-STAR MISCELLANEOUS DATA

RIGHT TRIANGLE FORMULAS



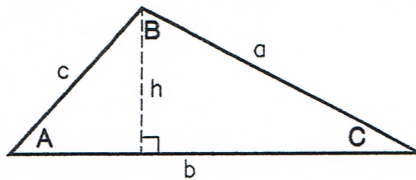
PYTHAGOREAN THEOREM: $a^2 + b^2 = c^2$

AREA: $\frac{1}{2}ab$

TRIGOMETRIC FUNCTIONS: $\sin A = \frac{a}{c}$ $\cos A = \frac{b}{c}$

$\tan A = \frac{a}{b}$

OBLIQUE TRIANGLE FORMULAS

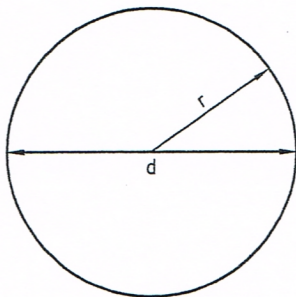


LAW OF SINES: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

LAW OF COSINES: $a^2 = b^2 + c^2 - 2bc \cos A$

AREA: $\frac{1}{2}bh$

CIRCLE FORMULAS



DIAMETER = d RADIUS = r

CIRCUMFERENCE: $2\pi r$ or πd

AREA: πr^2

ONE DEGREE (1°) OF ARC = 60 MINUTES (60') OF ARC

ONE MINUTE (1') OF ARC = 60 SECONDS (60'') OF ARC

THEREFORE ONE DEGREE OF ARC (1°) = 3600 SECONDS OF ARC.

TRIG-STAR ANSWER KEY LOCAL CONTEST

PAGE 1

$$\sphericalangle CBA = 54^{\circ}49'29''$$

$$\text{DISTANCE AC} = 154.39$$

PAGE 1

$$\sphericalangle EGF = 17^{\circ}36'36''$$

$$\text{DISTANCE EH} = 72.59$$

$$\text{DISTANCE FH} = 70.31$$

$$\text{DISTANCE FG} = 232.40$$

$$\text{DISTANCE GH} = 221.51$$

PAGE 2

$$\text{DISTANCE AB} = 217.95$$

$$\text{DISTANCE AD} = 388.13$$

$$\text{DISTANCE AC} = 423.71$$

PAGE 3

$$\text{DISTANCE AB} = 36.24$$

$$\text{DISTANCE CD} = 31.62$$

$$\text{DISTANCE DE} = 20.05$$

$$\text{DISTANCE EF} = 25.88$$

$$\text{DISTANCE CF} = 70.71$$

$$\text{ARC DISTANCE CF} = 78.54$$