



TRIG-STAR

2019-2020 Sample Problems

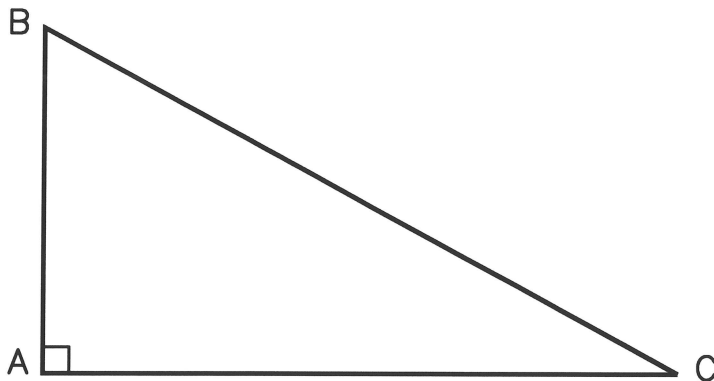


NSPS

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National Society of Professional Surveyors

TRIG-STAR PROBLEM LOCAL CONTEST

PRINT NAME: _____



KNOWN: DISTANCE AC = 1264.46 DISTANCE BC = 1681.98

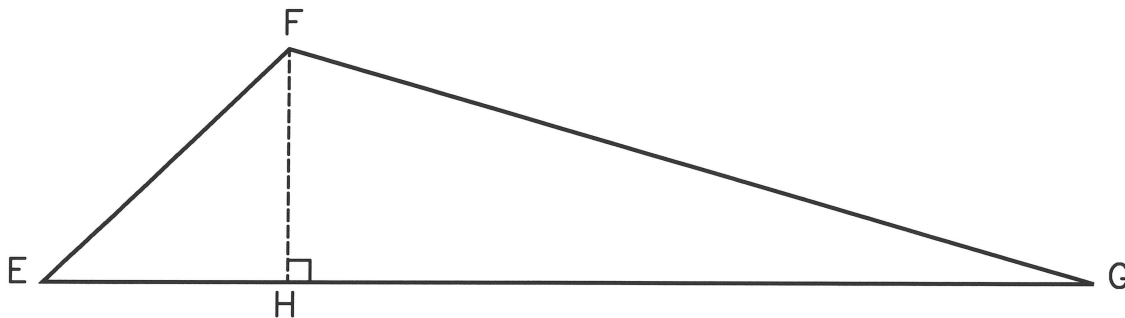
FIND: \angle ACB = _____ (5 POINTS)

DISTANCE AB = _____ (5 POINTS)

REQUIRED ANSWER FORMAT

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

TRIG-STAR PROBLEM LOCAL CONTEST



KNOWN: DISTANCE EF = 505.22 \angle EFG = 117°01'18" \angle FEG = 48°08'05"

FIND: \angle EGF = _____ (6 POINTS)

DISTANCE EH = _____ (6 POINTS)

DISTANCE FH = _____ (6 POINTS)

DISTANCE FG = _____ (6 POINTS)

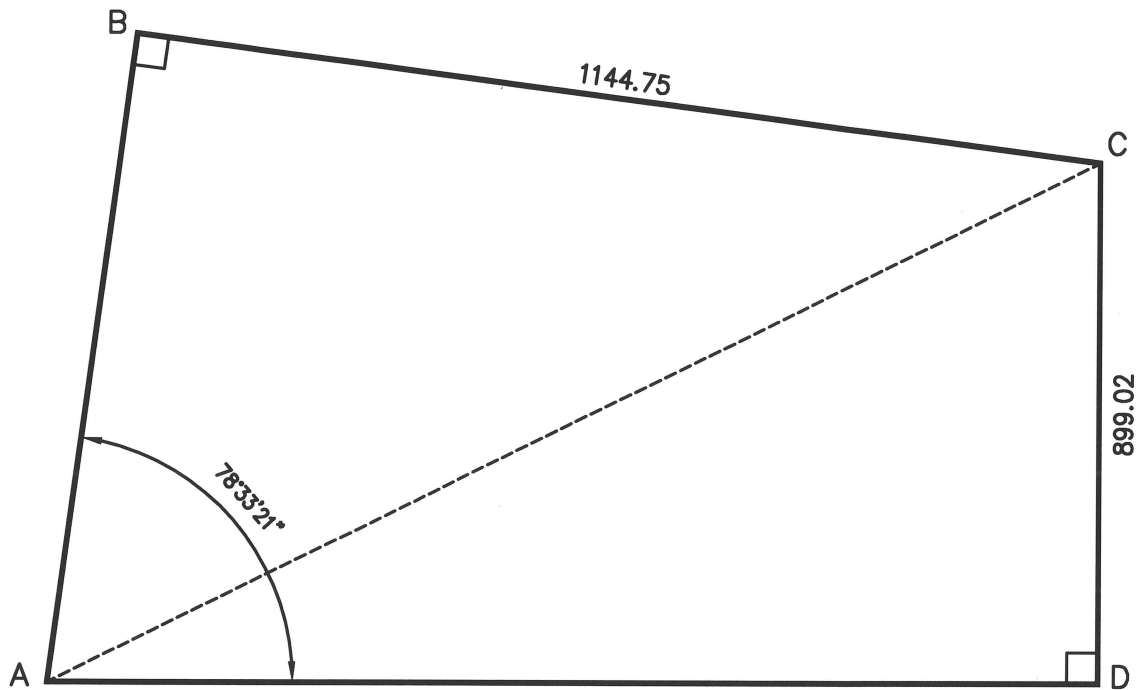
DISTANCE GH = _____ (6 POINTS)

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 = 1144.75 DISTANCE CD = 899.02
 $\angle BAD = 78^{\circ}33'21''$

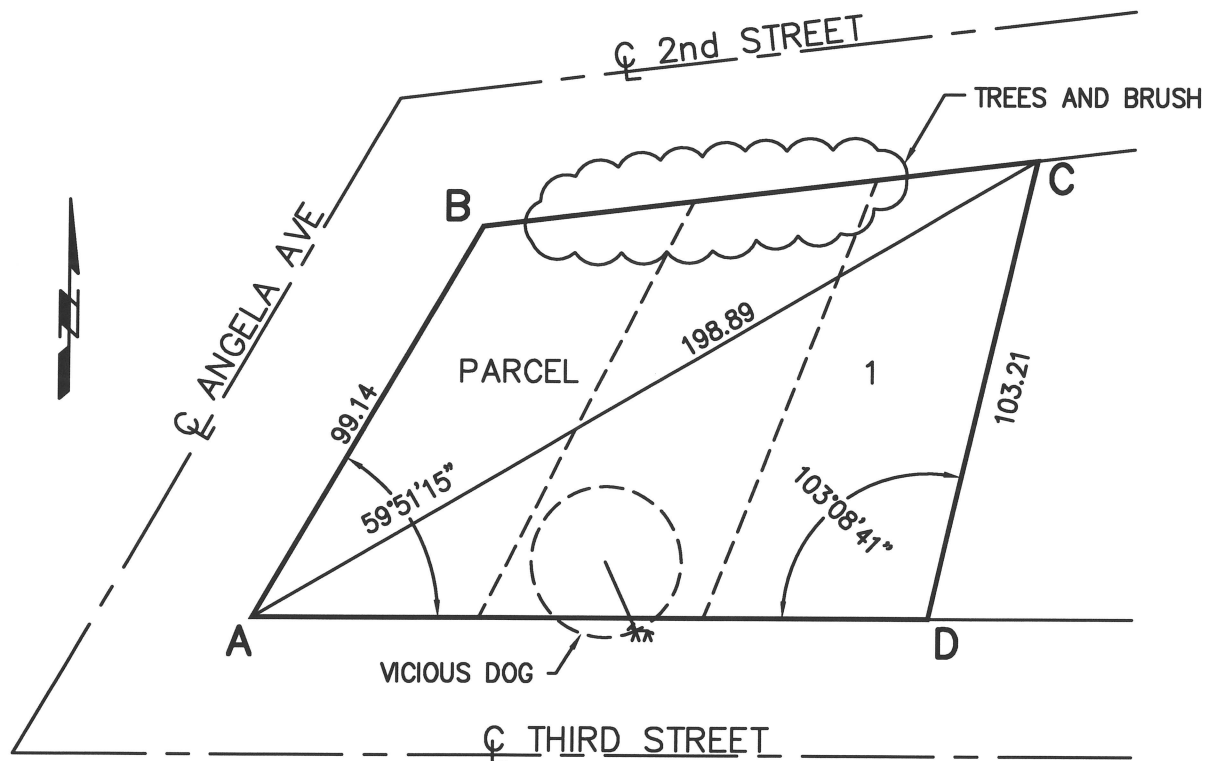
FIND: DISTANCE AB = _____ (10 POINTS)
DISTANCE AD = _____ (10 POINTS)
DISTANCE AC = _____ (10 POINTS)

REQUIRED ANSWER FORMAT
DISTANCES: NEAREST HUNDREDTH

PAGE TOTAL: _____ POINTS

TRIG—STAR PROBLEM LOCAL CONTEST

LEO OWNS A PIECE OF LAND, SHOWN IN THE SKETCH AS PARCEL 1. HE WISHES TO DIVIDE THE PROPERTY INTO THREE PARCELS OF EQUAL AREA AND GIVE ONE TO EACH OF HIS THREE SONS. TO BE COMPLETELY FAIR TO EACH SON, LEO ALSO WANTS EACH PARCEL TO HAVE AN EQUAL AMOUNT OF FRONTAGE ALONG THIRD STREET. LEO HAS HIRED SURVEYOR SUSAN TO HELP DIVIDE PARCEL 1. DUE TO OBSTACLES IN HER WAY, SHE WAS UNABLE TO GET ALL ANGLES AND DISTANCES OF THE PARCEL. SHE OBTAINED THE ANGLES AND DISTANCES AS SHOWN AND NOW NEEDS TO COMPLETE HER CALCULATIONS.



FIND: DISTANCE AD = _____ (6 POINTS)

DISTANCE BC = _____ (6 POINTS)

ANGLE ABC = _____ (6 POINTS)

DISTANCE BD = _____ (6 POINTS)

AREA ABCD = _____ (6 POINTS)

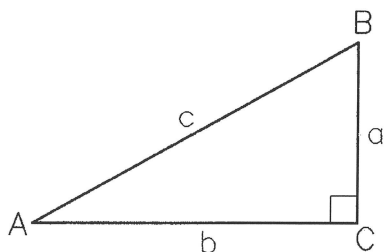
REQUIRED ANSWER FORMAT

DISTANCES: NEAREST HUNDREDTH
 ANGLES: DEGREES—MINUTES—SECONDS
 TO THE NEAREST SECOND
 AREA: NEAREST SQUARE UNIT

PAGE TOTAL: _____ POINTS

TRIG-STAR MISCELLANEOUS DATA

RIGHT TRIANGLE FORMULAS



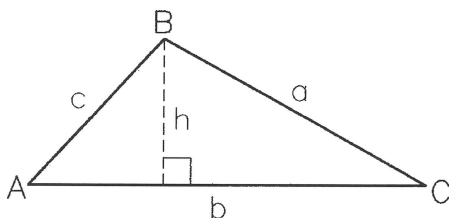
PYTHAGOREAN THEOREM: $a^2 + b^2 = c^2$

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

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

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

OBLIQUE TRIANGLE FORMULAS

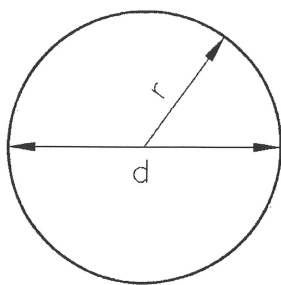


LAW OF SINES: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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

$$\angle ACB = 41^{\circ}15'22''$$

$$\text{DISTANCE AB} = 1109.14$$

PAGE 1

$$\angle EGF = 14^{\circ}50'37''$$

$$\text{DISTANCE EH} = 337.17$$

$$\text{DISTANCE FH} = 376.25$$

$$\text{DISTANCE FG} = 1468.67$$

$$\text{DISTANCE GH} = 1419.66$$

PAGE 2

$$\text{DISTANCE AB} = 1149.00$$

$$\text{DISTANCE AD} = 1349.97$$

$$\text{DISTANCE AC} = 1621.93$$

PAGE 3

$$\text{DISTANCE AD} = 148.16$$

$$\text{DISTANCE BC} = 122.73$$

$$\angle ABC = 127^{\circ}03'36''$$

$$\text{DISTANCE BD} = 130.48$$

$$\text{AREA ABCD} = 12,300$$