TRIG*STAR

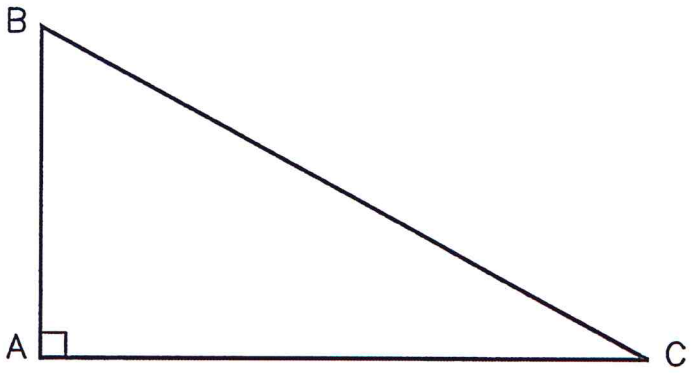
SAMPLE PROBLEMS

Sponsored by the
National Society of Professional Surveyors

2014-15

TRIG–STAR PROBLEM LOCAL CONTEST

PRINT NAME: _____



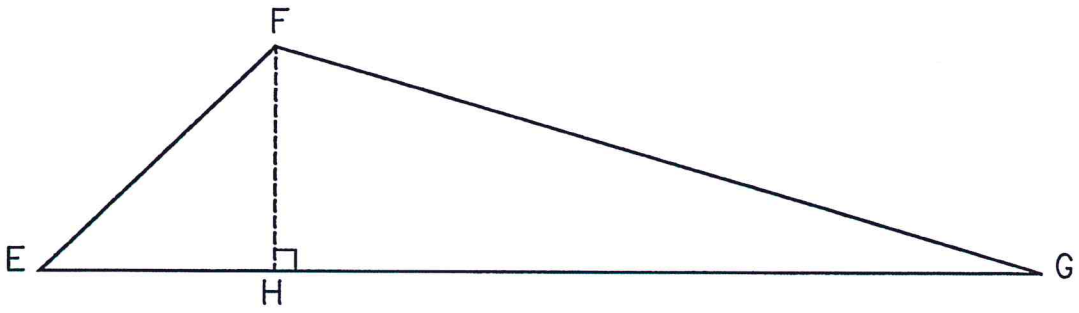
KNOWN: DISTANCE AC = 381.25 DISTANCE BC = 431.23

FIND: ∠ 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 = 193.31 ∠ EFG = 121°31'30" ∠ FEG = 41°50'14"

FIND: ∠ EGF = _____ (6 POINTS)

DISTANCE EH = _____ (6 POINTS)

DISTANCE FH = _____ (6 POINTS)

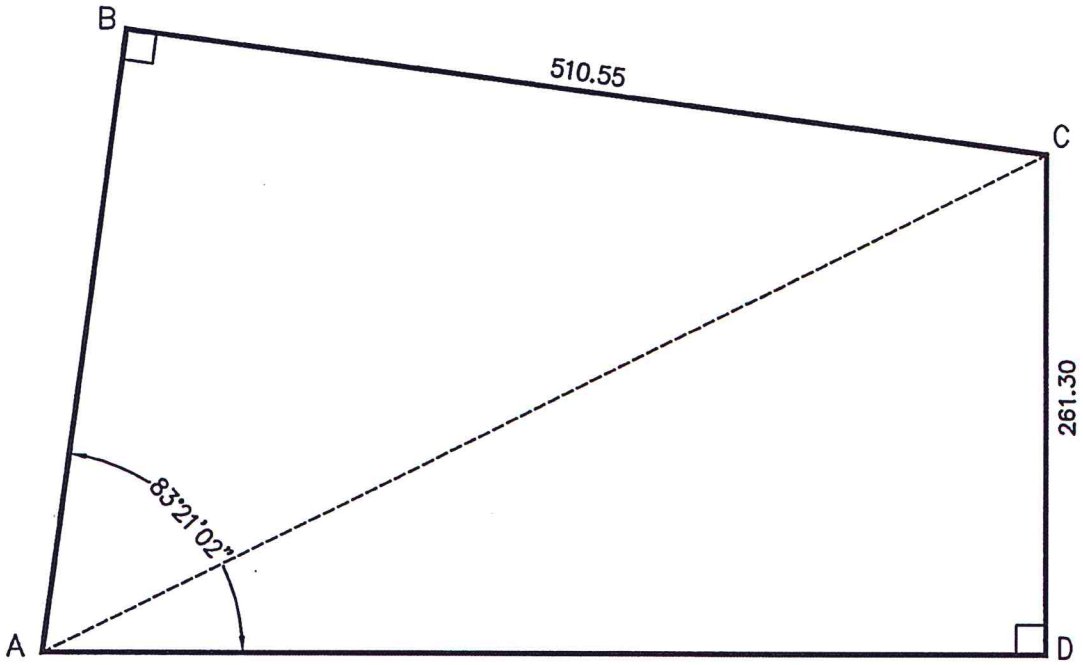
DISTANCE FG = _____ (6 POINTS)

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 = 510.55 DISTANCE CD = 261.30
$\measuredangle$ BAD = 83°21'02"

FIND: DISTANCE AB = _____ (10 POINTS)

DISTANCE AD = _____ (10 POINTS)

DISTANCE AC = _____ (10 POINTS)

REQUIRED ANSWER FORMAT
DISTANCES: NEAREST HUNDREDTH

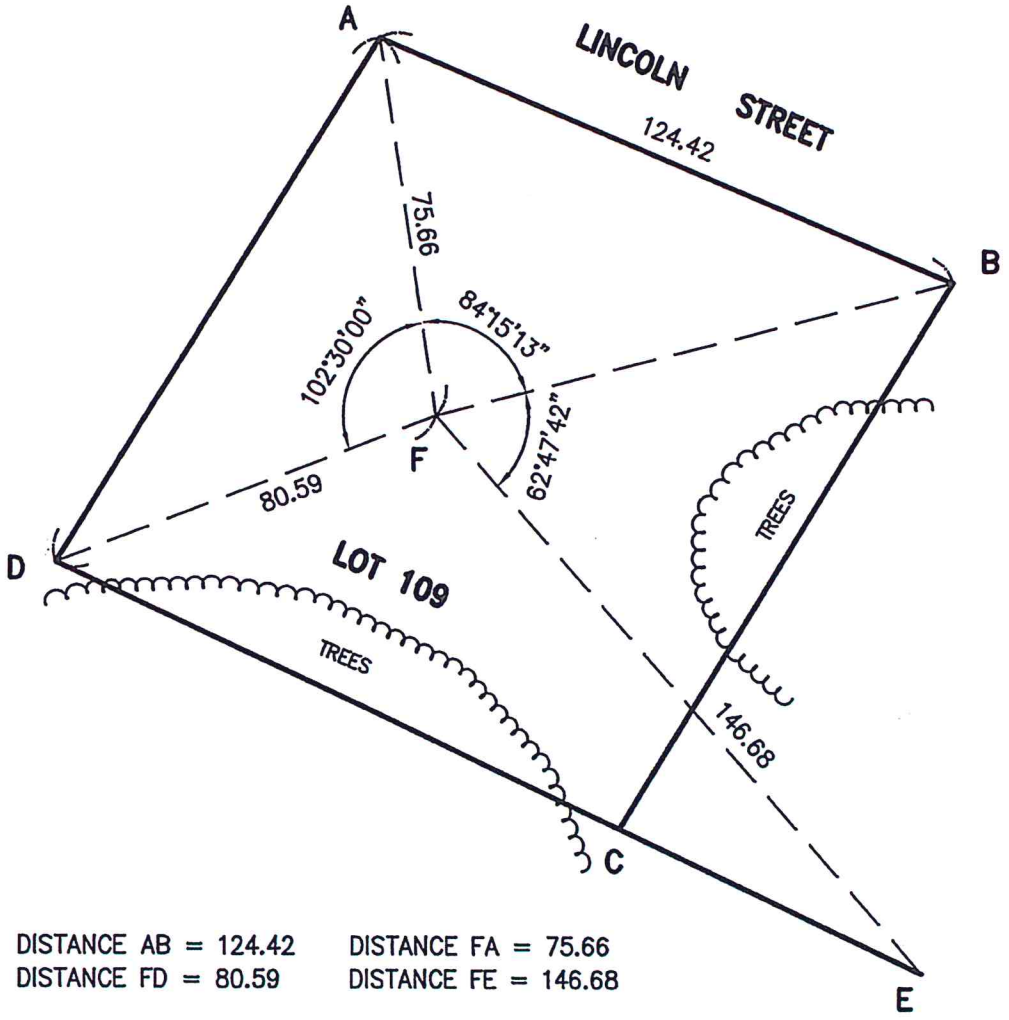
PAGE TOTAL: _____ POINTS

TRIG–STAR PROBLEM LOCAL CONTEST

THE OWNER OF LOT 109, SHOWN AS FIGURE ABCD, WANTS TO OBTAIN A BUILDING PERMIT, AND HIRES A LAND SURVEYOR TO COMPLETE A BOUNDARY SURVEY.

THE SURVEYOR FINDS EXISTING MONUMENTS AT POINTS A, B, AND D, AND NEEDS TO REESTABLISH POINT C. TREES OBSTRUCT THE VIEW ALONG LOT LINES AS SHOWN, SO THE SURVEYOR SETS A CONTROL POINT AT POINT F FROM WHICH ALL FOUR LOT CORNER LOCATIONS CAN BE SEEN. THE SURVEYOR ALSO FINDS A MONUMENT AT POINT E, AND NOTES THAT POINT C WOULD BE ON A STRAIGHT LINE CONNECTING POINTS D AND E. IT IS ALSO NOTED THAT LINE AD IS PARALLEL TO LINE BC.

THE SURVEYOR'S MEASURED ANGLES AND DISTANCES ARE SHOWN BELOW.



DISTANCE AB = 124.42 DISTANCE FA = 75.66
DISTANCE FD = 80.59 DISTANCE FE = 146.68

DISTANCE DA = _____ (6 POINTS)

DISTANCE FC = _____ (6 POINTS)

DISTANCE DC = _____ (6 POINTS)

ANGLE BFC = _____ (6 POINTS)

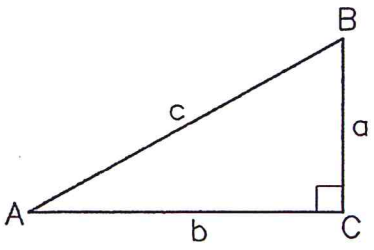
AREA ABCD = _____ (6 POINTS)

REQUIRED ANSWER FORMAT
DISTANCES: NEAREST HUNDREDTH
AREA: NEAREST WHOLE UNIT

PAGE TOTAL: _____ POINTS

TRIG–STAR MISCELLANEOUS DATA

RIGHT TRIANGLE FORMULAS



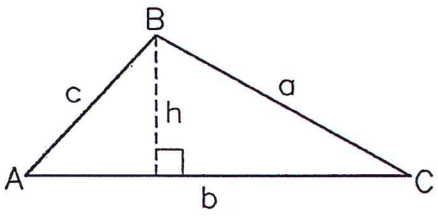
PYTHAGOREAN THEOREM: $a^2 + b^2 = c^2$

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

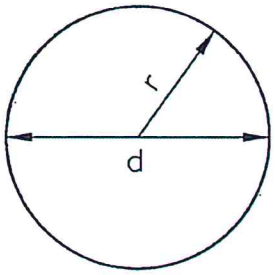


LAW OF SINES: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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

∠ ACB =	27°51'33"
DISTANCE AB =	201.51

PAGE 1

∠ EGF =	16°38'16"
DISTANCE EH =	144.02
DISTANCE FH =	128.94
DISTANCE FG =	450.34
DISTANCE GH =	431.48

PAGE 2

DISTANCE AB =	322.59
DISTANCE AD =	544.47
DISTANCE AC =	603.92

PAGE 3

DISTANCE DA =	121.90
DISTANCE FC =	89.47
DISTANCE DC =	123.78
∠ BFC =	79°58'42"
AREA ABCD =	15,287