SAMPLE PROBLEMS

Sponsored by the National Society of Professional Surveyors

2015-16
TRIG–STAR PROBLEM  LOCAL CONTEST

PRINT NAME: __________________________

KNOWN: DISTANCE AC = 415.23  DISTANCE BC = 512.09

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 = 240.88  \( \angle EFG = 118°05'50" \)  \( \angle FEG = 40°12'25" \)

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 = 530.98  DISTANCE CD = 243.27
\[ \angle BAD = 85^\circ 01' 42" \]

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


DISTANCE BC = 348.42  DISTANCE CD = 87.29  DISTANCE DA = 289.52
DISTANCE GH = 184.75  DISTANCE GB = 60.99  DISTANCE GE = 76.41
DISTANCE HA = 91.03  DISTANCE HF = 45.97  \( \angle BGH = 60°39’20” \)
\( \angle HGE = 36°20’59” \)  \( \angle AHG = 54°22’12” \)  \( \angle GHF = 47°58’52” \)

\[ \text{DISTANCE BE} = \quad \text{(6 POINTS)} \]
\[ \text{DISTANCE AF} = \quad \text{(6 POINTS)} \]
\[ \text{DISTANCE AB} = \quad \text{(6 POINTS)} \]
\[ \text{ANGLE ABE} = \quad \text{(6 POINTS)} \]
\[ \text{DISTANCE EF} = \quad \text{(6 POINTS)} \]

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

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PAGE TOTAL: \( \quad \) POINTS

SHEET 3 OF 3
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 \( \pi d \)

AREA: \( \pi r^2 \)

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 = 35°49'14"
DISTANCE AB = 299.70

PAGE 1

∠EGF = 21°41'45"
DISTANCE EH = 183.96
DISTANCE FH = 155.50
DISTANCE FG = 420.64
DISTANCE GH = 390.84

PAGE 2

DISTANCE AB = 290.38
DISTANCE AD = 554.15
DISTANCE AC = 605.19

PAGE 3

DISTANCE BE = 103.42
DISTANCE AF = 110.41
DISTANCE AB = 103.94
∠ABE = 83°44'05"
DISTANCE EF = 93.11