TRIG\*STAR

2011-2012

SAMPLE PROBLEMS

Sponsored by the National Society of Professional Surveyors
TRIG-STAR PROBLEM LOCAL CONTEST

PRINT NAME: ____________________________

KNOWN:  
DISTANCE AB = 178.20  
DISTANCE BC = 373.58

FIND:  
\( \angle CBA = \)  
(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 = 188.58  \( \angle EFG = 121^\circ 25' 12'' \)  \( \angle FEG = 41^\circ 57' 27'' \)

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

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SHEET 1 OF 3
KNOWN: DISTANCE BC = 504.27  DISTANCE CD = 265.56
∠ BAD = 83°20'06"

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 GOVERNMENT HAS CONSTRUCTED OFFSHORE COMMUNICATION TOWERS TO HELP MONITOR THE COASTAL WATERS. A FIBER OPTIC CABLE NEEDS TO BE CONNECTED FROM THE POINTS ON LAND TO THE TOWERS FOR INCREASED SECURITY. THIS CABLE WILL ENABLE THE TOWERS TO TRANSMIT MORE INFORMATION QUICKER, FOR SURVEILLANCE AND ENVIRONMENTAL PURPOSES.

FIND:

DISTANCE AC = ________________ (4 POINTS)
DISTANCE AD = ________________ (5 POINTS)
DISTANCE BD = ________________ (4 POINTS)
DISTANCE BC = ________________ (5 POINTS)
DISTANCE CD = ________________ (5 POINTS)
DISTANCE AB = ________________ (7 POINTS)

REQUIRED ANSWER FORMAT
DISTANCES: NEAREST HUNDREDTH

PAGE TOTAL: _______ POINTS
TRIG-STAR MISCELLANEOUS DATA

RIGHT TRIANGLE FORMULAS

[Diagram of a right triangle]

PYTHAGOREAN THEOREM: \( a^2 + b^2 = c^2 \)

AREA: \( \frac{1}{2}ab \)

TRIGONOMETRIC FUNCTIONS:

\[
\begin{align*}
\sin A &= \frac{a}{c} & \cos A &= \frac{b}{c} \\
\tan A &= \frac{a}{b}
\end{align*}
\]

OBlique TRIANGLE FORMULAS

[Diagram of an oblique triangle]

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

$\angle CBA = \boxed{61^\circ 30'36''}$

DISTANCE AC = \boxed{328.34}

PAGE 1

$\angle EGF = \boxed{16^\circ 37'21''}$

DISTANCE EH = \boxed{140.24}

DISTANCE FH = \boxed{126.08}

DISTANCE FG = \boxed{440.74}

DISTANCE GH = \boxed{422.32}

PAGE 2

DISTANCE AB = \boxed{326.29}

DISTANCE AD = \boxed{538.73}

DISTANCE AC = \boxed{600.63}

PAGE 3

DISTANCE AC = \boxed{994.01}

DISTANCE AD = \boxed{666.89}

DISTANCE BD = \boxed{891.07}

DISTANCE BC = \boxed{586.07}

DISTANCE CD = \boxed{456.99}

DISTANCE AB = \boxed{1087.93}