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

TRIG-STAR PROBLEM LOCAL CONTEST

KNOWN: DISTANCE EF = 188.58 \( \angle \ EFG = 121'25'12'' \quad \angle \ FEG = 41'57'27'' \)

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

PAGE TOTAL: _________ POINTS
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
RIGHT TRIANGLE FORMULAS

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

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

TRIGOMETRIC FUNCTIONS:
\[
\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \\
\tan A = \frac{a}{b}
\]

OBLIQUE TRIANGLE FORMULAS

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

LAW OF COSINES:
\[
c^2 = b^2 + c^2 - 2bc \cos A
\]

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

CIRCLE FORMULAS

DIAMETER = \( d \)  \quad  RADIUS = \( r \)

CIRCUMFERENCE: \( 2\pi r \) or \( \pi d \)

AREA: \( \pi r^2 \)

ONE DEGREE (\( 1^\circ \)) 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.
### PAGE 1

- $\angle CBA = 61'30''36''$
- $\text{DISTANCE AC} = 328.34$

### PAGE 1

- $\angle EGF = 16'37''21''$
- $\text{DISTANCE EH} = 140.24$
- $\text{DISTANCE FH} = 126.08$
- $\text{DISTANCE FG} = 440.74$
- $\text{DISTANCE GH} = 422.32$

### PAGE 2

- $\text{DISTANCE AB} = 326.29$
- $\text{DISTANCE AD} = 538.73$
- $\text{DISTANCE AC} = 600.63$

### PAGE 3

- $\text{DISTANCE AC} = 994.01$
- $\text{DISTANCE AD} = 666.89$
- $\text{DISTANCE BD} = 891.07$
- $\text{DISTANCE BC} = 586.07$
- $\text{DISTANCE CD} = 456.99$
- $\text{DISTANCE AB} = 1087.93$