



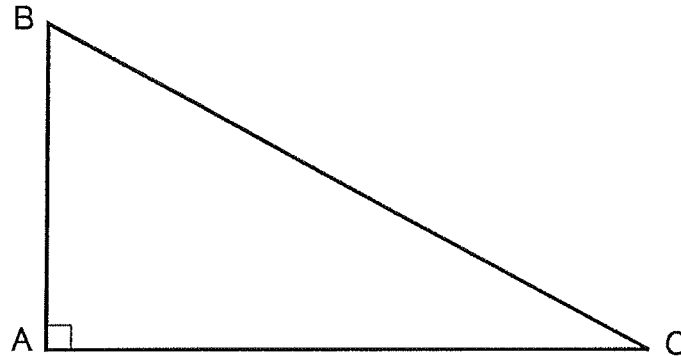
2012-2013

SAMPLE PROBLEMS

Sponsored by the National Society of Professional Surveyors

TRIG-STAR PROBLEM LOCAL CONTEST

PRINT NAME: _____



KNOWN: DISTANCE AB = 179.12 DISTANCE BC = 375.63

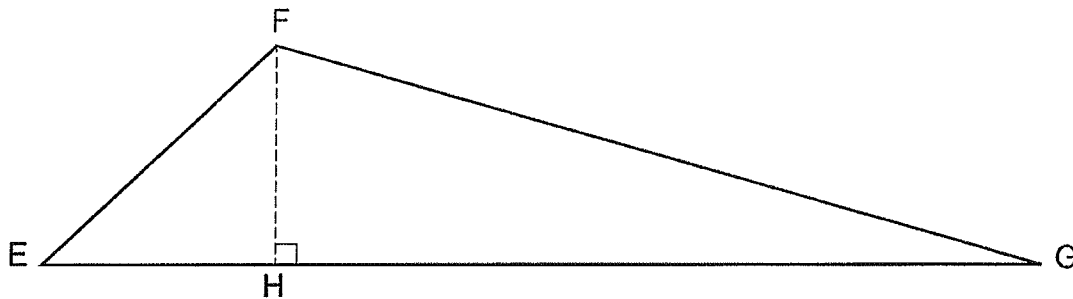
FIND: $\angle CBA =$ _____ (5 POINTS)

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 = 190.81 $\angle EFG = 120^{\circ}57'18''$ $\angle FEG = 42^{\circ}24'54''$

FIND: $\angle EGF =$ _____ (6 POINTS)

DISTANCE EH = _____ (6 POINTS)

DISTANCE FH = _____ (6 POINTS)

DISTANCE FG = _____ (6 POINTS)

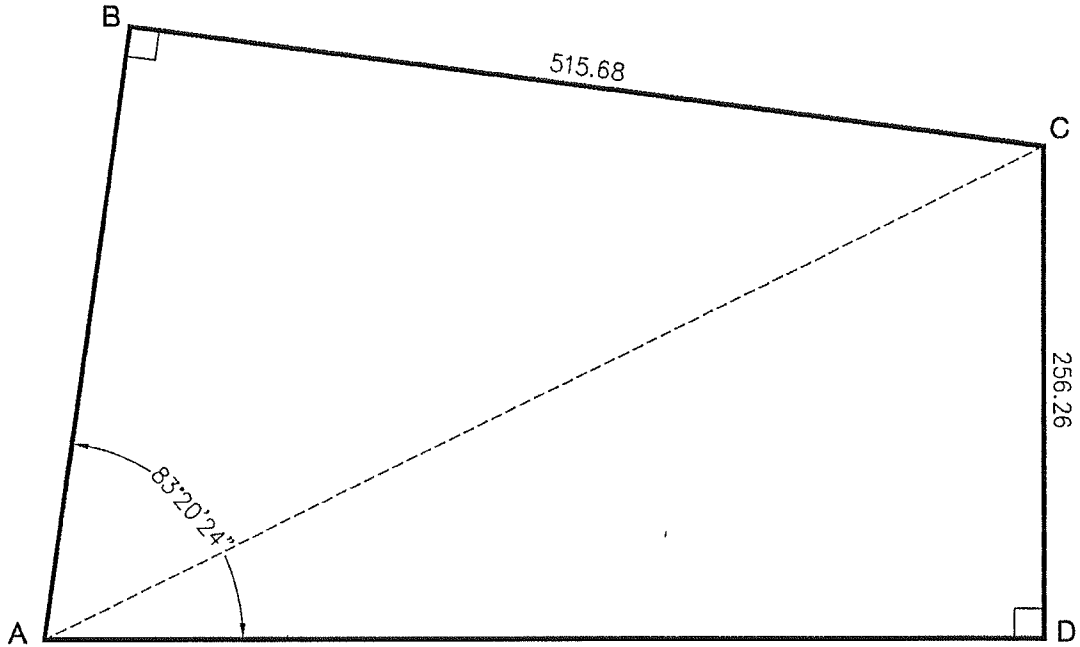
DISTANCE GH = _____ (6 POINTS)

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 = 515.68 DISTANCE CD = 256.26
 \angle BAD = 83°20'24"

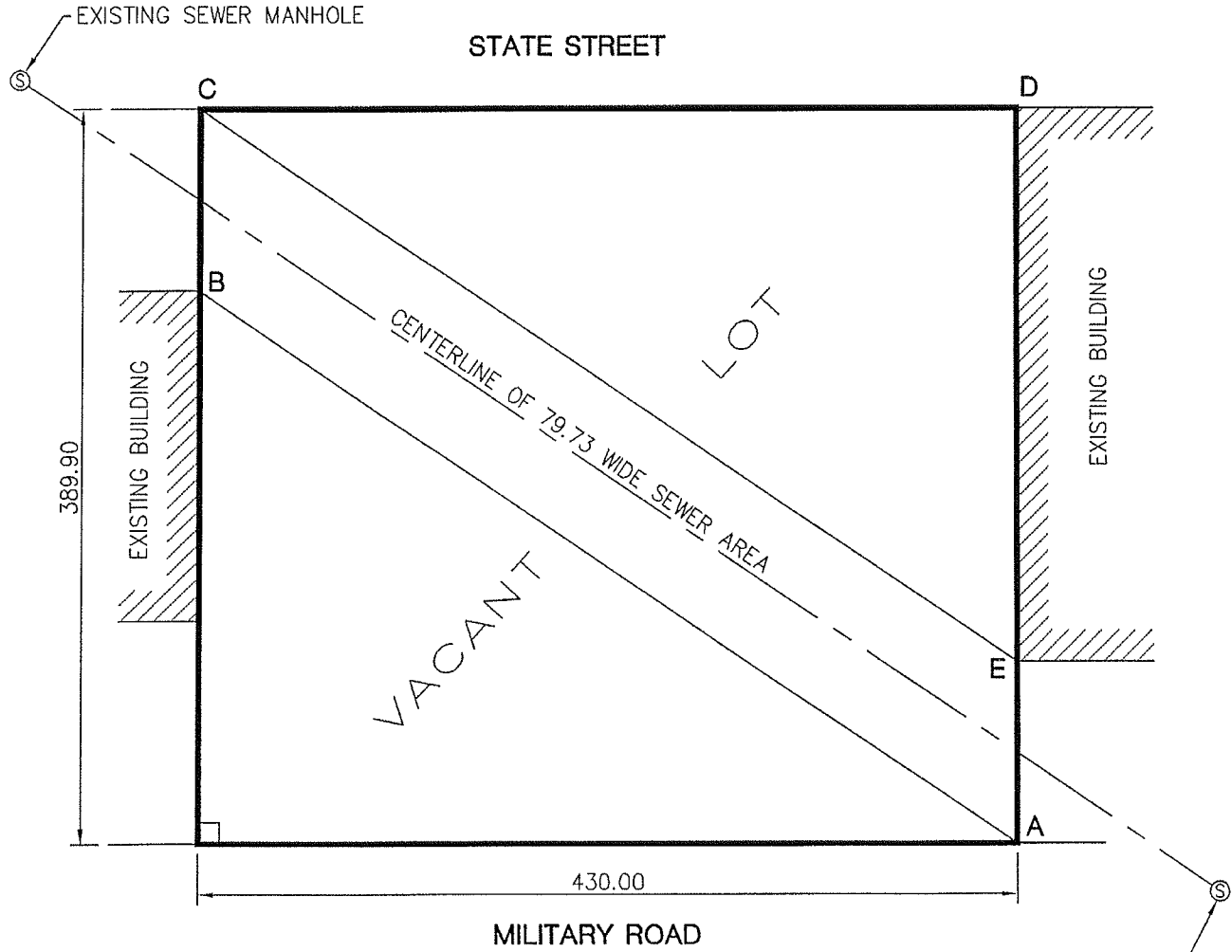
FIND: DISTANCE AB = _____ (10 POINTS)
DISTANCE AD = _____ (10 POINTS)
DISTANCE AC = _____ (10 POINTS)

REQUIRED ANSWER FORMAT
DISTANCES: NEAREST HUNDREDTH

PAGE TOTAL: _____ POINTS

TRIG-STAR PROBLEM LOCAL CONTEST

A MANUFACTURING PLANT WOULD LIKE TO EXPAND BUT NEEDS MORE SEWER CAPACITY. THE CITY HAS AGREED TO HELP BY INSTALLING A NEW SEWER LINE ACROSS A RECTANGULAR SHAPED VACANT LOT TO A NEW MANHOLE FOR THE PLANT'S CONVENIENCE. THE SEWER LINE WILL NEED AN AREA 79.73 IN WIDTH FOR CONSTRUCTION AND MAINTENANCE PURPOSES. THIS AREA IS TO BE PLACED ON THE VACANT LOT SUCH THAT THE OPPOSITE SIDES PASS THROUGH THE DIAGONAL CORNERS OF THE LOT. THE OWNER OF THE VACANT LOT WOULD LIKE MORE INFORMATION BEFORE SELLING THE SEWER AREA TO THE CITY.



- FIND:
- DISTANCE AC = _____ (5 POINTS)
 - DISTANCE AE = _____ (6 POINTS)
 - DISTANCE CE = _____ (6 POINTS)
 - AREA ABCE = _____ (6 POINTS)
 - AREA CDE = _____ (7 POINTS)

NEW SEWER MANHOLE FOR
MANUFACTURING PLANT

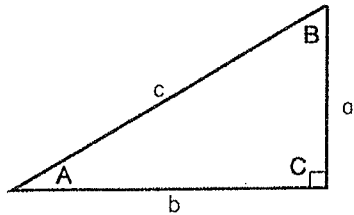
REQUIRED ANSWER FORMAT

DISTANCES: NEAREST HUNDREDTH
AREA: NEAREST WHOLE UNIT

PAGE TOTAL: _____ POINTS

TRIG-STAR MISCELLANEOUS DATA

RIGHT TRIANGLE FORMULAS

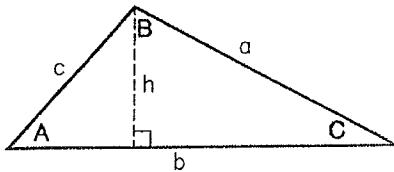


PYTHAGOREAN THEOREM: $a^2 + b^2 = c^2$

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

TRIGOMETRIC FUNCTIONS: $\sin A = \frac{a}{c}$ $\cos A = \frac{b}{c}$
 $\tan A = \frac{a}{b}$

OBLIQUE TRIANGLE FORMULAS

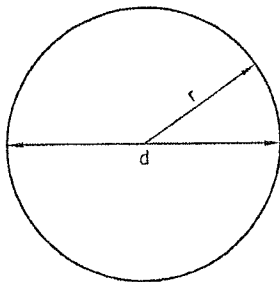


LAW OF SINES: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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

$$\sphericalangle CBA = \boxed{61^{\circ}31'12''}$$

$$\text{DISTANCE AC} = \boxed{330.17}$$

PAGE 1

$$\sphericalangle EGF = \boxed{16^{\circ}37'48''}$$

$$\text{DISTANCE EH} = \boxed{140.87}$$

$$\text{DISTANCE FH} = \boxed{128.70}$$

$$\text{DISTANCE FG} = \boxed{449.70}$$

$$\text{DISTANCE GH} = \boxed{430.89}$$

PAGE 2

$$\text{DISTANCE AB} = \boxed{318.21}$$

$$\text{DISTANCE AD} = \boxed{549.11}$$

$$\text{DISTANCE AC} = \boxed{605.96}$$

PAGE 3

$$\text{DISTANCE AC} = \boxed{580.45}$$

$$\text{DISTANCE AE} = \boxed{96.52}$$

$$\text{DISTANCE CE} = \boxed{520.55}$$

$$\text{AREA ABCE} = \boxed{41503}$$

$$\text{AREA CDE} = \boxed{63077}$$