



**TRIG-STAR**

# **SAMPLE TEST**



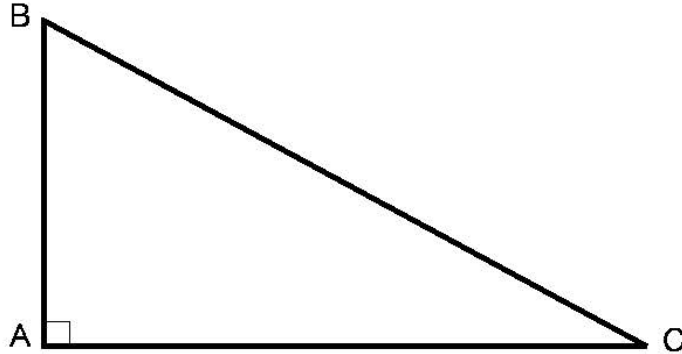
***NSPS***

**National Society of Professional Surveyors**

**240-439-4615 | [trig-star.com](http://trig-star.com)**

## TRIG-STAR PROBLEM LOCAL COMPETITION

PRINT NAME: \_\_\_\_\_



KNOWN: DISTANCE AB = 103.14      DISTANCE BC = 191.75

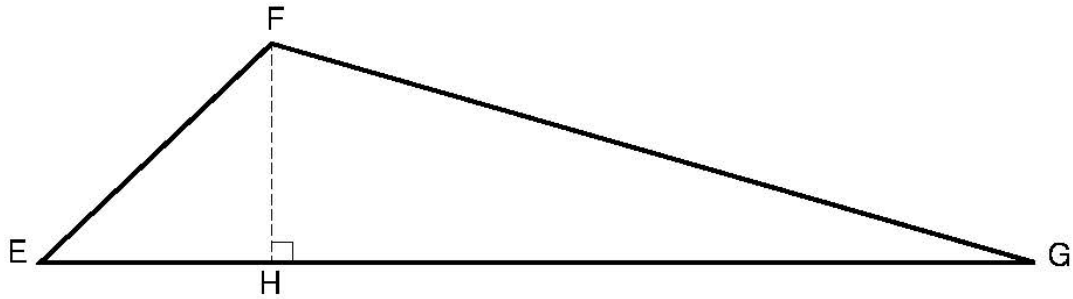
FIND:  $\angle$  CBA = \_\_\_\_\_ (5 POINTS)

DISTANCE AC = \_\_\_\_\_ (5 POINTS)

REQUIRED ANSWER FORMAT

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

## TRIG-STAR PROBLEM LOCAL COMPETITION



KNOWN: DISTANCE EF = 111.67     $\angle$  EFG = 120°13'57"     $\angle$  FEG = 42°00'18"

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

DISTANCE EH = \_\_\_\_\_ (6 POINTS)

DISTANCE FH = \_\_\_\_\_ (6 POINTS)

DISTANCE FG = \_\_\_\_\_ (6 POINTS)

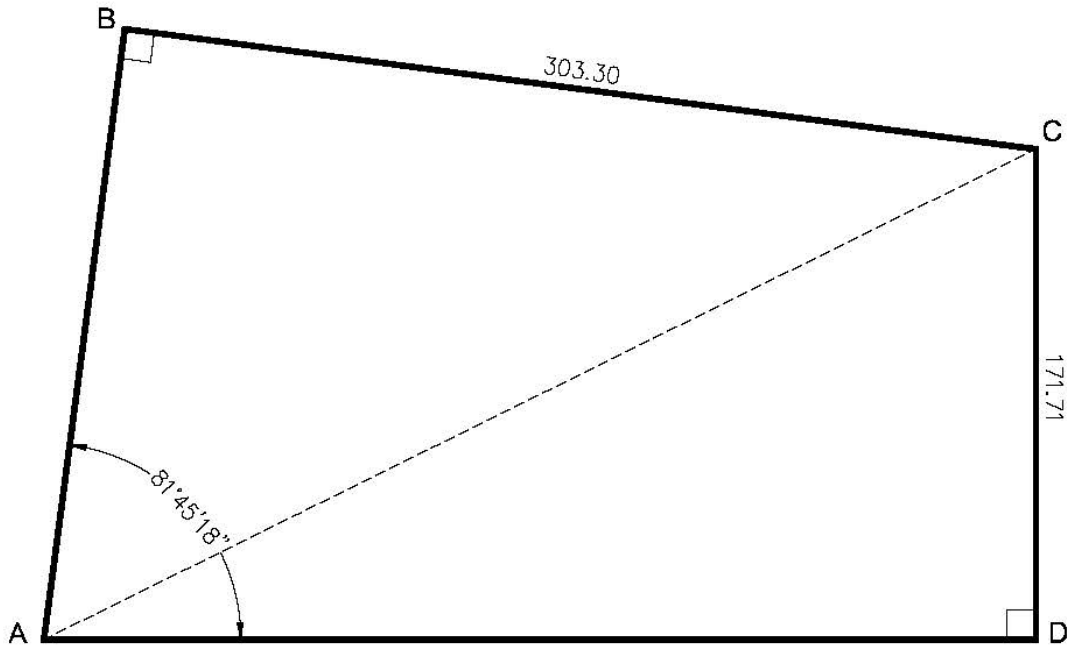
DISTANCE GH = \_\_\_\_\_ (6 POINTS)

REQUIRED ANSWER FORMAT

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

PAGE TOTAL: \_\_\_\_\_ POINTS

# TRIG-STAR PROBLEM LOCAL COMPETITION



KNOWN: DISTANCE BC = 303.30    DISTANCE CD = 171.71  
 $\angle$  BAD = 81°45'18"

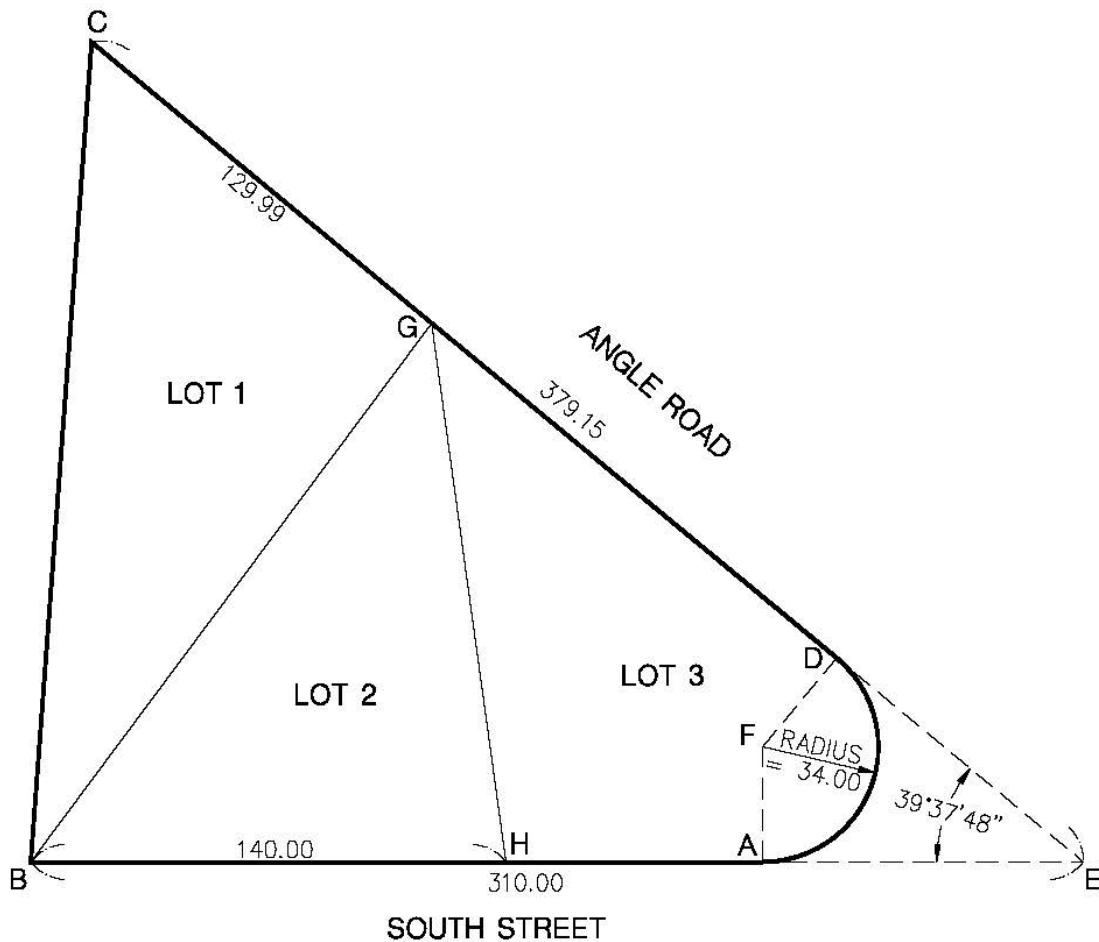
FIND: DISTANCE AB = \_\_\_\_\_ (10 POINTS)  
DISTANCE AD = \_\_\_\_\_ (10 POINTS)  
DISTANCE AC = \_\_\_\_\_ (10 POINTS)

REQUIRED ANSWER FORMAT  
DISTANCES: NEAREST HUNDREDTH

PAGE TOTAL: \_\_\_\_\_ POINTS

# TRIG-STAR PROBLEM LOCAL COMPETITION

A FATHER HAS DIVIDED A TRACT OF LAND AS SHOWN BY FIGURE A, B, C, D, AND ARC DA INTO LOTS FOR HIS THREE CHILDREN. THE TIME HAS COME FOR THE CHILDREN TO DETERMINE WHO GETS WHICH LOT. THEY DECIDE TO DRAW FROM A DECK OF CARDS FOR FIRST AND SECOND CHOICE. THE CHILDREN WOULD LIKE MORE INFORMATION BEFORE THEY MAKE THEIR CHOICES.



FIND:

DISTANCE BC = \_\_\_\_\_ (5 POINTS)

DISTANCE BG = \_\_\_\_\_ (5 POINTS)

DISTANCE GH = \_\_\_\_\_ (5 POINTS)

ARC DISTANCE AD = \_\_\_\_\_ (5 POINTS)

AREA LOT 1 = B,C,G,B = \_\_\_\_\_ (5 POINTS)

AREA LOT 3 = A,H,G,D, ARC DA = \_\_\_\_\_ (5 POINTS)

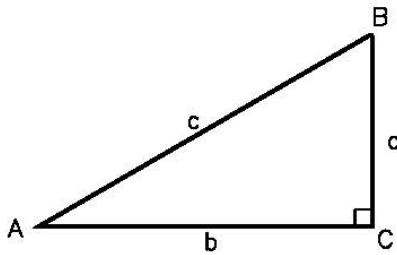
**REQUIRED ANSWER FORMAT**

DISTANCES: NEAREST HUNDREDTH  
AREA: NEAREST WHOLE UNIT

PAGE TOTAL: \_\_\_\_\_ POINTS

# TRIG-STAR MISCELLANEOUS DATA

## RIGHT TRIANGLE FORMULAS



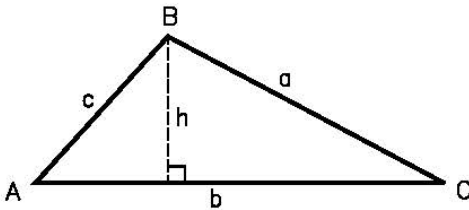
PYTHAGOREAN THEOREM:  $a^2 + b^2 = c^2$

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

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

$\tan A = \frac{a}{b}$

## OBLIQUE TRIANGLE FORMULAS



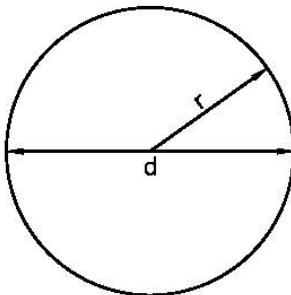
LAW OF SINES:  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

LAW OF COSINES:  $a^2 = b^2 + c^2 - 2bc \cos A$

$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$

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

## CIRCLE FORMULAS



DIAMETER =  $d$       RADIUS =  $r$

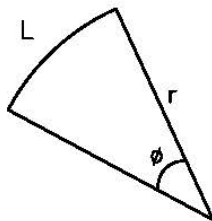
CIRCUMFERENCE:  $2\pi r$  or  $\pi d$

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.



ARC LENGTH =  $2\pi r\phi/360$

AREA:  $\pi r^2(\phi/360)$

# TRIG-STAR ANSWER KEY LOCAL COMPETITION

PAGE 1

$$\sphericalangle CBA = 57^{\circ}27'36''$$

$$\text{DISTANCE AC} = 161.65$$

---

PAGE 1

$$\sphericalangle EGF = 17^{\circ}45'45''$$

$$\text{DISTANCE EH} = 82.98$$

$$\text{DISTANCE FH} = 74.73$$

$$\text{DISTANCE FG} = 244.96$$

$$\text{DISTANCE GH} = 233.28$$

---

PAGE 2

$$\text{DISTANCE AB} = 217.45$$

$$\text{DISTANCE AD} = 331.35$$

$$\text{DISTANCE AC} = 373.20$$

---

PAGE 3

$$\text{DISTANCE BC} = 242.50$$

$$\text{DISTANCE BG} = 198.00$$

$$\text{DISTANCE GH} = 160.42$$

$$\text{ARC DISTANCE AD} = 83.30$$

$$\text{AREA OF LOT 1} = B,C,G,B = 12,851$$

$$\text{AREA OF LOT 3} = A,H,G,D,ARC DA = 11,716$$