

# TRIG—STAR ANSWER KEY LOCAL CONTEST

PAGE 1

$$\sphericalangle ACB = 36^{\circ}49'27''$$

$$\text{DISTANCE AB} = 443.63$$

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PAGE 1

$$\sphericalangle EGF = 23^{\circ}00'35''$$

$$\text{DISTANCE EH} = 284.75$$

$$\text{DISTANCE FH} = 263.63$$

$$\text{DISTANCE FG} = 674.44$$

$$\text{DISTANCE GH} = 620.78$$

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PAGE 2

$$\text{DISTANCE AB} = 478.19$$

$$\text{DISTANCE AD} = 893.56$$

$$\text{DISTANCE AC} = 967.49$$

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## 17.2 Fall Problem Corner Answer Key

$$\text{DISTANCE AB} = 130.00$$

$$\text{DISTANCE BC} = 200.00$$

$$\text{DISTANCE HI} = 28.00$$

$$\text{DISTANCE BE} = 18.83$$

$$\text{AREA BCFE} = 3,753$$



NATIONAL SOCIETY OF PROFESSIONAL SURVEYORS  
Trig-Star Contest Test Cover Sheet - Local Contest

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**CONTESTANT INFORMATION (PLEASE PRINT)**

Name \_\_\_\_\_ Graduation Year \_\_\_\_\_

High School \_\_\_\_\_ High School Address:

Street: \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Home Address: \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Email \_\_\_\_\_

Parent / Guardian Names \_\_\_\_\_

Math/Trigonometry Teacher's Full Name \_\_\_\_\_

Phone or Email \_\_\_\_\_

Sponsor's Name or Company \_\_\_\_\_

**I HEREBY STATE THAT THE WORK PERFORMED ON THIS EXAM IS MY OWN WORK DONE WITHOUT THE AID OF COMPUTER / CALCULATOR SOFTWARE PROGRAMS.**

Signature \_\_\_\_\_ Date \_\_\_\_\_

*Check for information about careers in Surveying and Mapping and associated scholarships.*

**CONTEST RULES**

1. One (1) hour maximum for completion of the competition.
2. Place answers in the spaces provided - answers shown elsewhere will not count. Be sure to give answers in the format requested.
3. All competition materials will be collected when you are finished.
4. Raise both hands when you finish - your time will be noted to the nearest second.
5. After your competition paper is collected you may leave the room, unless instructed otherwise.
6. First place is awarded to the highest score. In the event of a tie score, the student that completed the competition first will win.

**PLEASE PLACE YOUR NAME ON THE FIRST PAGE OF THE TEST  
(THIS COVER PAGE WILL NOT BE RETURNED TO YOU)  
DO NOT BEGIN THE TEST UNTIL INSTRUCTED TO DO SO  
GOOD LUCK!**

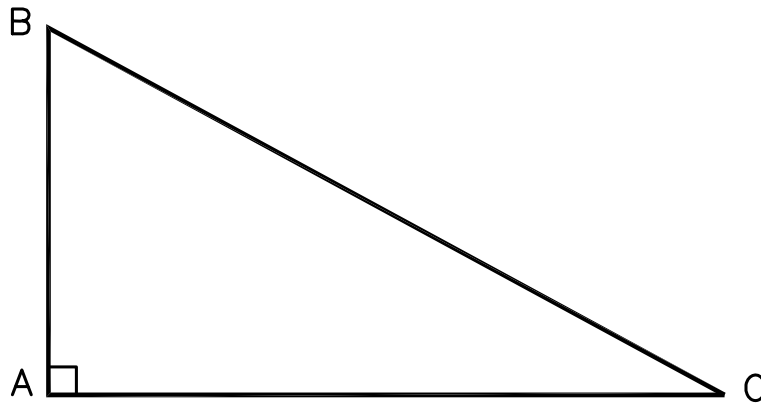
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FOR INSTRUCTORS USE

Time \_\_\_\_\_ (nearest second) Point Total \_\_\_\_\_

# TRIG-STAR PROBLEM LOCAL CONTEST

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



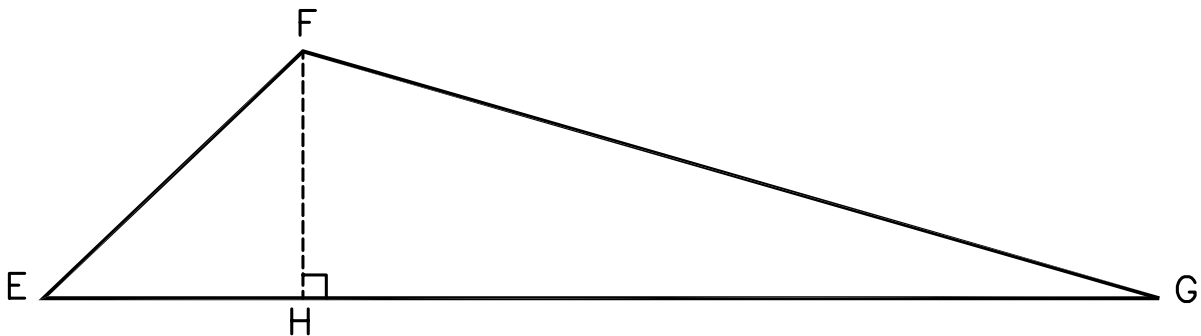
KNOWN: DISTANCE AC = 592.49      DISTANCE BC = 740.17

FIND:       $\sphericalangle$  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 = 388.05       $\sphericalangle$  EFG = 114°11'45"       $\sphericalangle$  FEG = 42°47'40"

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

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

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

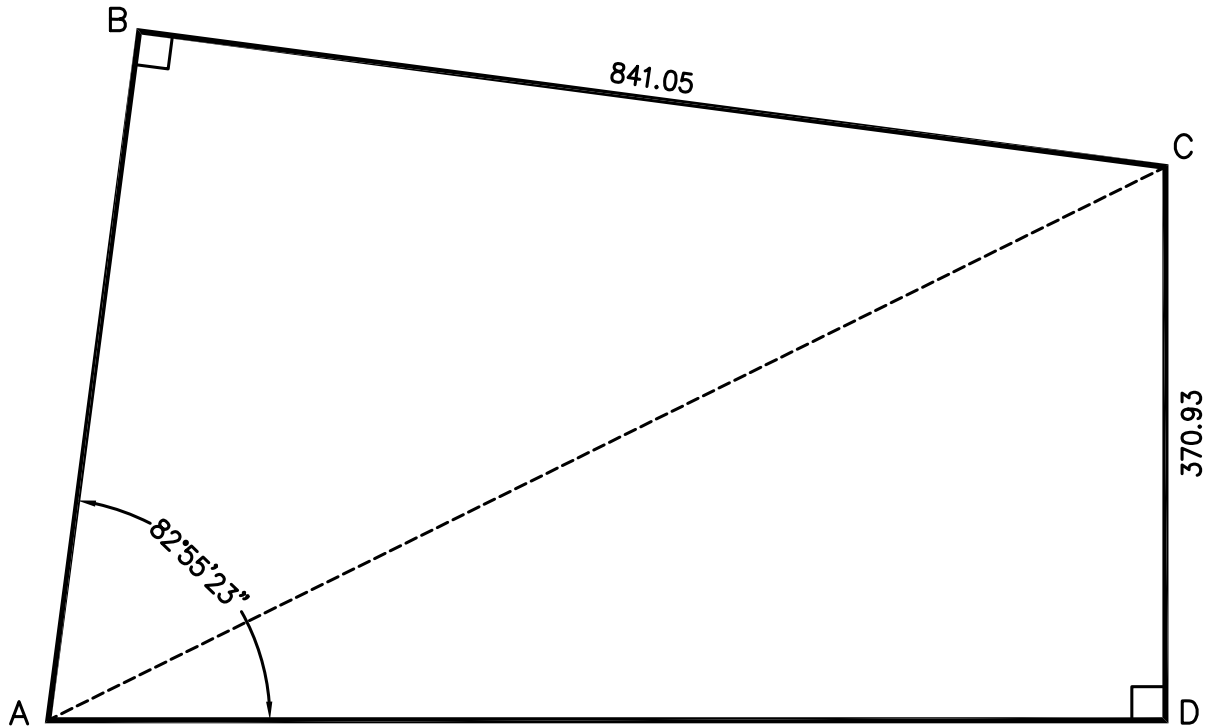
DISTANCE FG = \_\_\_\_\_ (6 POINTS)

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 = 841.05    DISTANCE CD = 370.93  
 $\angle$  BAD = 82°55'23"

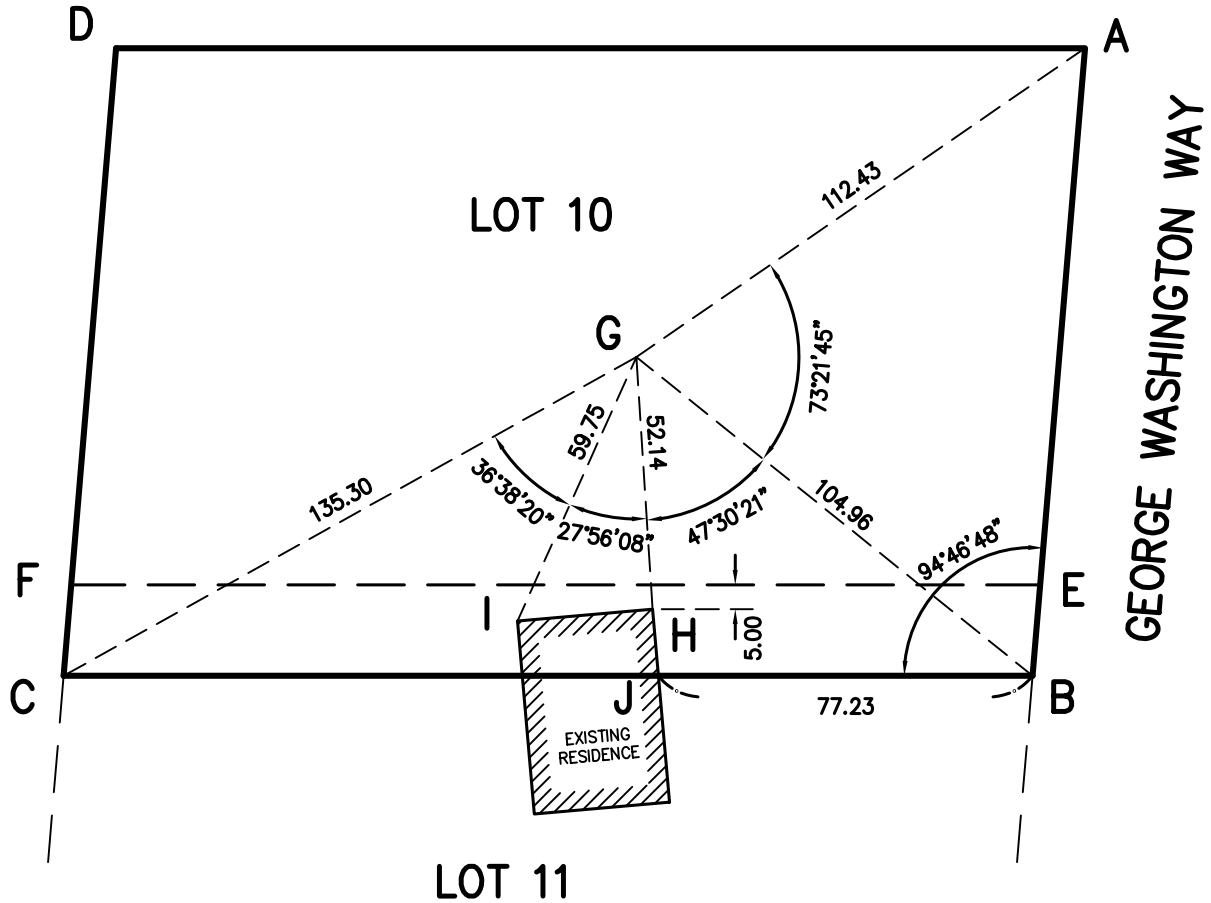
- FIND: DISTANCE AB = \_\_\_\_\_ (10 POINTS)  
DISTANCE AD = \_\_\_\_\_ (10 POINTS)  
DISTANCE AC = \_\_\_\_\_ (10 POINTS)

**REQUIRED ANSWER FORMAT**  
DISTANCES: NEAREST HUNDREDTH

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

# TRIG-STAR PROBLEM LOCAL CONTEST

THE OWNER OF LOT 10 IS PREPARING TO HAVE A HOUSE BUILT ON THE LOT. THE RESULTS OF A LAND SURVEY OF LOT 10 SHOWS THAT A PORTION OF THE EXISTING RESIDENCE THAT WAS BUILT FOR THE OWNER OF LOT 11 IS OVER THE LOT LINE. IT IS NECESSARY THAT A PORTION OF LOT 10 BE SOLD TO THE OWNER OF LOT 11. THE CITY REQUIRES THAT THE NEW LINE IS TO BE 5.00 FEET (BY PERPENDICULAR MEASUREMENT) FROM THE CLOSEST CORNER OF THE EXISTING RESIDENCE, AND THAT THE NEW LINE IS TO BE PARALLEL WITH THE SOUTH LINE OF LOT 10. THE SURVEYOR'S MEASURED ANGLES AND DISTANCES ARE SHOWN BELOW. (NOTE: LINE AD IS PARALLEL TO AND EQUAL IN DISTANCE TO LINE BC.)



DISTANCE GA = 112.43	DISTANCE GB = 104.96	DISTANCE GH = 52.14
DISTANCE GI = 59.75	DISTANCE GC = 135.30	DISTANCE BJ = 77.23
ANGLE ABC = 94°46'48"	ANGLE BGA = 73°21'45"	ANGLE HGB = 47°30'21"
ANGLE IGH = 27°56'08"	ANGLE CGI = 36°38'20"	

- DISTANCE AB = \_\_\_\_\_ (6 POINTS)
- DISTANCE BC = \_\_\_\_\_ (6 POINTS)
- DISTANCE HI = \_\_\_\_\_ (6 POINTS)
- DISTANCE BE = \_\_\_\_\_ (6 POINTS)
- AREA BCFE = \_\_\_\_\_ (6 POINTS)

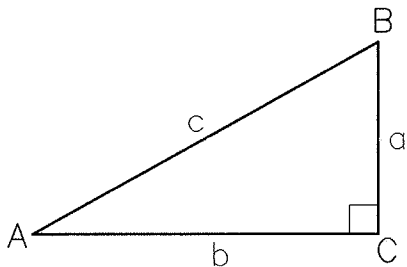
**REQUIRED ANSWER FORMAT**

DISTANCES: NEAREST HUNDREDTH  
AREA: NEAREST FULL UNIT

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

# TRIG-STAR MISCELLANEOUS DATA

## RIGHT TRIANGLE FORMULAS



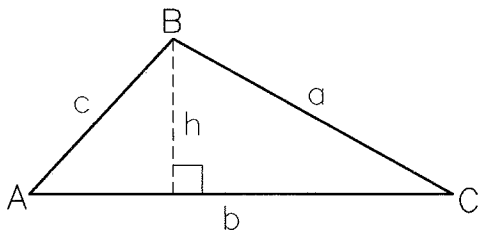
PYTHAGOREAN THEOREM:  $a^2 + b^2 = c^2$

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

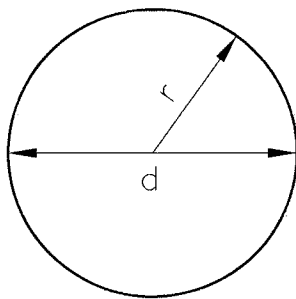


LAW OF SINES:  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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.