



2017-2018
TRIG ★ STAR
Competition
Packet

National Society of Professional Surveyors

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Trig-Star is an annual competition sponsored by the National Society of Professional Surveyors and you, the local sponsor. The program goal is to recognize and stimulate the best students of mathematics from among school districts across the United States utilizing a competition with awards. The purpose of the Trig-Star program is:

- ▶ To promote excellence in the mastery of mathematics in high school;
- ▶ To honor high school students who have demonstrated their superior skill among classmates at the local, state and national levels;
- ▶ To acquaint high school students with the use and practical applications of mathematics in the surveying professions;
- ▶ To build an awareness of surveying and mapping as a profession among mathematically skilled high school students, career guidance counselors, and high school math teachers.

Your assistance is critical to ensuring the success of the Trig-Star program. Trig-Star can be a tremendous public relations event for the surveying and mapping profession. High school students, their parents, teachers, and the public see first-hand some of the work undertaken by surveying and mapping professionals, and the concern of the profession for rewarding academic achievement and teaching excellence. Thank you for taking the time to become a Trig-Star sponsor.

The Trig-Star contest can be a good way to introduce high school students to available surveying and mapping college degree programs. Please encourage those students who may have any interest in information on careers and scholarships to check the box on the cover of the contest form.

Trig-Star local contest results must be submitted through the online form www.nsp.us.com - scroll over NSPS Trig-Star Program and select Contest Report Forms

Please review the enclosed material carefully. Each state is responsible for running its own state Trig-Star contest in order to choose a state Trig-Star champion who will compete in the National Trig-Star competition. Please contact the state Trig-Star coordinator about the program in your state. A list of State Coordinators is available on the Trig-Star web site. In addition to any awards at the local and state level, the State Trig-Star will be eligible to compete for \$2,000, \$1000, and \$500 national prizes. In addition the Teaching Excellence Awards provide cash awards for the teachers of the national winners.

With your assistance we can maximize the exposure of the surveying and mapping profession to the next generation and create a strong positive image of our profession. The Trig-Star endowment fund was created to insure the future of our scholarship program and provide increased benefits. Please consider sponsorship of the endowment fund with a tax-deductible gift. More information about the fund and Trig-Star can be found on the web at www.trig-star.info. Thank you for your assistance and support of Trig-Star.

Gerald Juarez, NSPS Trig-Star Chair



"TRIGONOMETRY! WHY DO I HAVE TO LEARN THIS?"

How often do you hear this question from a student? Or maybe they ask, "When will I ever use this?" Either question can be difficult to answer, but we can help you answer their questions. As a land surveyor, our profession uses trigonometry every day, and we would appreciate the opportunity to inform your high school students about a career in surveying and mapping and about a contest called "Trig-Star".

Trig-Star is a national competition developed by the National Society of Professional Surveyors (NSPS) and is administered by local professional surveyors. Typically, a local surveyor will spend a classroom session with your students to acquaint them with our profession, and provide them with information about the contest. At a later date, the local surveyor will administer the one hour long contest, utilizing real world trigonometry problems. The only thing that we need from you is the opportunity.

We want to help you prepare your students for their future, by providing them with information about a profession that requires the trigonometry skills that they are learning in your classroom. We can help your students develop an appreciation for the knowledge they are acquiring and show them, through examples, that trigonometry is a skill that they may need in their careers.

Every year across the United States, successful Trig-Star students and teachers receive generous prizes and other awards from local state, and national sponsors. Every year, trig-Star students and teachers become more aware of the career opportunities which utilize the math skills developed in High School. Every year, Trig-Star students and teachers find the answers to the questions that are always asked in a trigonometry class.

There are nearly 10,000 students currently participating on the national level. The contest is simple to administer and rewarding for everyone involved. Give a local professional surveyor a few minutes to tell you about the program and give you some sample questions to try.



TRIG-STAR CONTEST AWARDS & TESTING DATES

LOCAL CONTEST – LEVEL 1

Local contest must be given in time to submit names to state coordinator for state competition.

ONCE THE LOCAL CONTEST IS COMPLETE THE SPONSOR MUST ENTER THE CONTEST INFORMATION ONLINE. THE FORM IS LOCATED AT:

Trig-Star local contest results must be submitted through the online form www.nsp.us.com. Scroll over NSPS Trig-Star Program and select Contest Report Forms.

STATE WINNERS

State Trig-Star Coordinators shall submit the State Trig-Star winners name, photo, and biographical information to NSPS between May 1 and June 1. Please contact your State Trig-Star coordinator regarding scheduling to insure your local Trig-Star contest is given in a time frame so that your winner will be eligible to compete for the State Trig-Star title. Please refer to the State Coordinators list included with this packet.

NATIONAL CONTEST – LEVEL 2

State Trig-Star winners test administrators will receive the National Trig-Star test 2 weeks after submission of the winner's name to NSPS. Test should be administered in accordance with the instructions and returned to NSPS with a postmark no later than July 1.

CONTEST AWARDS

The National Trig-Star first place winner will receive a \$2,000 award, the National Trig-Star second place winner a \$1,000 award, and the National Trig-Star third place winner a \$500 award in addition to any awards at the state and local level. The student's trigonometry teachers will receive a Teacher Excellence Award in the amount of \$1,000 for first place, \$500 for second place, and \$250 for third place.



National Society of Professional Surveyors

Preparation for the Local Contest

CONTACTING YOUR LOCAL HIGH SCHOOL

Making first contact with a teacher in the math department is often the hardest thing to do when trying to get a Trig-Star Program going. Here are some tips:

- ▶ Do you know any teacher, guidance counselor or administrator at your local high school that could introduce you to a math teacher?
- ▶ Do any of your children, grandchildren, nieces, nephews, etc., attend a nearby high school where you would be willing to visit to present the Trig-Star program/test?
- ▶ Are there any of your neighbors or friends at church or social groups, teachers or school employees, or your fellow employees who may be able to steer you in the right direction to contact the trigonometry teacher or math department head?
- ▶ Find out when a teacher is available and make your contact at that time, don't wait for them to call you.

PRESENTATION SUGGESTIONS

One of the most important parts of the Trig Star Contest is your presentation of career information. The objective is to discuss Surveying and Mapping with the students. Tell them briefly, what it is, why it's a good career, why we like it and how trigonometry is used in our business as a practical application of math.

There are many Trig-Star presentation formats that can be followed. The variations depend not only on your personal speaking style, but also on high school factors, such as the size of the group you will be talking to, the amount of time allowed for your presentation and the room configuration that you will be presenting in. For example, small groups allow for more demonstration of equipment and explanation of Survey Plats or Maps. Questions are more common in small groups and personal connections are easier to make.

On the other hand, larger groups will allow you to reach more students and you may feel that you have made more efficient use of your time. The more visual aids the better the presentation.



NCEES has developed a Speaker's Kit presentation. To download the kit visit **www.nsp.us.com** – scroll over the tab 'PR' and select Speaker's Kit.

Examples of Plats and Maps are always interesting to students, especially if it shows an area they are familiar with. An aerial photo, which includes their school in part of the photo, would be a good tool. Setting up a total station and allowing students to look through the telescope and see a measurement being made can be very interesting.

If you can engage the students in doing some sample calculations they feel more involved. For example, set up the total station in the classroom, a prism in the back of the room and another prism out the door in the hallway, if possible. Then measure the two distances and the interior angle between the lines. Sketch the measurements on the board and ask the students to solve for the unknown distance through the wall. If they seem unsure on how to approach the problem help them determine that they must use the law of cosines and fill out the equation on the board, then all students can perform the calculations on their calculators and come up with an answer.

It is also important to discuss what they should prepare for on the Trig-Star Exam, such as working with length in decimals of feet usually to the hundredths and angles in degrees, minutes and seconds, (DMS). Some schools cover DMS and the students seem to have a good understanding of this already. If they don't it is important to let them know this will be on the exam and they should prepare for it. Also, a brief discussion of rounding should be covered.

Often students will round off intermediate solutions and use these rounded values in additional calculations while working toward the final answer. This results in the accumulation of round off error and the final answer will most likely be close, but not to the precision needed to be counted as a correct answer.

It should be pointed out to the students that they might use a reference book during the exam if they so desire. Also, students will need to use a calculator capable of trig functions, however the use of calculators with coordinate geometry and/or triangle solution programs will not be allowed. If students have any of these programs loaded in their calculators they should be deprogrammed before the exam.



To prepare for your presentation visit www.trig-star.info

- 1) Contact the principal at the school for an appointment with the Trigonometry teacher or Math Department Head. Explain the Trig-Star program, your involvement as a local sponsor from the community, and the program of awards on the local, state and national level which includes recognition of the teachers.
- 2) Provide the teacher with a Trig-Star packet of sample problems and set a date and time for a presentation and contest. Help to determine the best time to give the contest for maximum participation, keeping in mind that many students have after school commitments.
- 3) Attend the contest and speak on careers in surveying and mapping. Review the contest and be prepared to explain the terms used in the questions.
- 4) Administer the contest. Check the student's answers and determine the contest winner.
Distribute the participation certificates.
- 5) File the electronic Trig-Star Contest Report. Send all contest cover sheets to your state coordinator. State Coordinators are listed on the NSPS website under the Trig-Star Program. **VERY IMPORTANT – FILE RESULTS WITH NSPS USING THE ONLINE FORM:**

Trig-Star local contest results must be submitted through the online form www.nsps.us.com - scroll over NSPS Trig-Star Program and select Contest Report Forms
- 6) Prepare any prizes and have the plaque engraved (if purchased) for the winning contestant. If possible arrange for a suitable time to present the award at a school function. Prepare and distribute press release.

FOR MORE INFORMATION CONTACT YOUR STATE COORDINATOR
OR VISIT www.trig-star.info



Before the test date, you may consider recruiting help from surveying students at the local technical college, or from other interested surveyors, who may be considering starting a Trig-Star program at another school in the future.

- 1) Secure a stop watch for timing the contestants.
- 2) Obtain the help of additional proctors as needed to assist you in timing the contestants as they complete the exam questions. (Larger groups of contestants may require 2 to 3 proctors.)
- 3) Remind the teachers and students that use of pre-programmed calculators is prohibited. Test proctors reserve the right to inspect the calculators at anytime.
- 4) Seat all contestants and pass out the test while instructing the contestants NOT to open the test materials until told to do so.
- 5) Have the contestants fill in the questions on the test cover sheet.
- 6) Read aloud the instructions given on the test cover sheet.
- 7) Instruct the contestants to turn in their test materials when finished since the winner will be determined on the highest score with the lowest time as a tiebreaker.
- 8) Instruct the contestants that finish early to sit quietly until all others are finished or until the end of the hour. Or you may instruct them to leave quietly when finished. Plan ahead with the high school teacher as to their preference on this matter.
- 9) Instruct the contestants to open the test materials, print their name in the space provided on the first page and begin.
- 10) Start the stop watch.
- 11) As the contestants finish they will raise both hands (special arrangements for those who are physically disabled may need to be made), record their time to the nearest second on the test cover sheet and collect the test.
- 12) After 60 minutes, collect all tests that have not been turned in and record a time of 60 minutes on them.



National Society of Professional Surveyors

Preparation for the Local Contest

If you are giving the exam by yourself, you may find it easier to take all the exams home and score them at a later time. If there are two or more of you giving the exam, while one person is keeping the official time (collecting completed exams and marking the times on them); the other person could be scoring the exams.

The highest score determines the Trig-Star winner. If there are two or more students with the same score, the shortest time of the group determines the winner.

Students naturally want to know how they did on the exam, even if they didn't come out on top. Obviously, for the security of the exam, you cannot give copies of the exams back to the students, but the teacher is free to go over the test with the class.

If you give a score sheet to the teacher, let them know about your scoring policy.

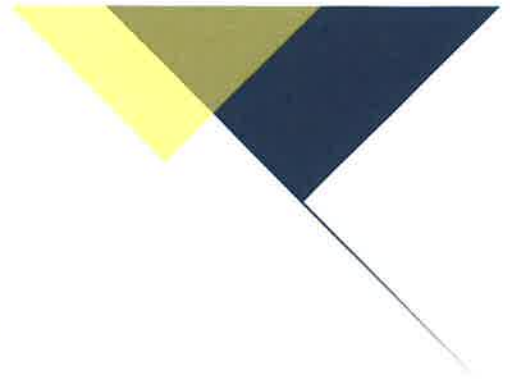
If purchased, have the Trig-Star plaque engraved with the winning student's name, high school name and year of the award. Also, include the sponsor's name on the plaque.

Another nice touch is to prepare certificates of participation for all the contestants. A blank certificate is provided with the Trig-Star test packet and on the NSPS (**www.trig-star.info**)

web site under Sponsor Resources. You can copy it onto certificate paper and add the participating student's names. Plan on returning to the high school for a Trig-Star award presentation. Make the presentation during the Trig-Star winner's math class if possible, or if the school has a spring semester award ceremony you may find this to be a good time to honor the Trig-Star winner.

Award the plaque and prize to the winner and give honorable mention recognition to those students who participated.

Prepare the news release form and submit it to the local newspaper for publication.



LOCAL CONTEST RULES

- 1) Only one TRIG-STAR is allowed per high school per year. The winner will be designated the TRIG-STAR for that particular school year.
- 2) All contestants in a particular high school must begin the TRIG-STAR test at the same time.
- 3) The winner is the student with the highest score in the fastest time to solve the problems provided.
- 4) The contest incorporates the use of complex trigonometric functions including right triangle formulas, circle formulas, the law of sines, and the law of cosines to solve real problems typically encountered in the surveying and mapping professions.
- 5) The competition is sanctioned nationally by the National Society of Professional Surveyors and state affiliates. The local sponsor is responsible for all contest fees, local promotion, news coverage, and presentation of local awards.
- 6) The use of calculators, textbooks, and notes is allowed. However, the use of any software programs, pre-loaded or manually loaded, is strictly forbidden.
- 7) There shall be no cost to the contestant for the privilege of competing for the award designation TRIG-STAR.
- 8) The maximum amount of time allowed for the testing is 60 minutes.





A High School Trigonometry Skill Awards Program
Administered by the National Society of Professional Surveyors

Plaque Order Form

Send Plaque to:

Name _____

Mailing Address _____

City _____ State _____ Zip _____

Phone Number () _____ Fax Number () _____

Email Address _____

Invoice to:

Purchase order number _____

Name _____

Billing Address _____

City _____ State _____ Zip _____

Phone Number () _____ Fax Number () _____

Email Address _____

Plaque fee: \$20.00 Enclosed is \$_____ for _____ Plaques.

Payment Options: invoice check Visa Mastercard AmEx Discover

Makes checks payable to NSPS TRIG-STAR

Card Number _____

Expiration Date ____/____ Security Code _____ Billing Zip Code _____

Name on Card _____ Signature _____

Email Address for receipt _____

Send order to:

TRIG-STAR, 5119 Pegasus Court, Suite Q, Frederick, MD 21704

Phone: 240-439-4615 Fax: 240-439-4952



TRIG-STAR NEWS RELEASE
2017-2018 TRIG-STAR

_____ has won the designation 2017-2018

TRIG-STAR FOR _____ HIGH SCHOOL in
competition held recently. He/She is the son/daughter of

_____.
from _____. The contest was sponsored by

_____.

A TRIG-STAR is a mathematics student who has demonstrated in competition that they are the most skilled among classmates in the practical application of trigonometry. The competition for the honor is a timed exercise which is the solving of a trigonometry problem that incorporates the use of right triangle formulas, circle formulas, the law of sines, and the law of cosines. The contest helps to promote careers in surveying and mapping to students at the High Schools across the country. The award is sponsored by the National Society of Professional Surveyors and cosponsored locally. State winners also have the opportunity to participate in the National TRIG-STAR competition for awards. Visit the Trig-Star website at www.trig-star.info.

For more information please contact:
Trig-Star Coordinator
5119 Pegasus Court, Suite Q
Frederick, MD 21704
240-439-4615

www.trig-star.info



NATIONAL SOCIETY OF
PROFESSIONAL SURVEYORS

CERTIFICATE OF PARTICIPATION

Is hereby presented to

In recognition of your participation in the

NATIONAL TRIG-STAR COMPETITION

Trigonometry Teacher

Local Sponsor

