

**2017 • 2018**



# **Mathematics**

# **Handbook**

For Contest Directors, Coaches and Contestants

UIL Mathematics Handbook is published annually by the University Interscholastic League.  
Any or all sections may be duplicated.

**Notice of Non-Discrimination**

The University Interscholastic League (UIL) does not discriminate on the basis of race, color, national origin, sex, disability, or age in its programs.

See Section 360, Non-Discrimination Policy, UIL *Constitution and Contest Rules*.

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## University Interscholastic League

### Mathematics Handbook

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The details in this handbook expand upon the information in the UIL Constitution & Contest Rules. In addition to this handbook, coaches, contestants and contest directors should read Sections 900-906 for information pertaining to all contests. See also the Academic Quick Reference Chart found at the end of this handbook and on the UIL website.

From the UIL Constitution & Contest Rules:

#### **Section 942: HIGH SCHOOL MATHEMATICS CONTEST**

- (a) THE CONTEST.
  - (1) Purpose. The Mathematics Contest is intended to encourage interest in math, to develop talent in problem solving skills and to inspire students to excel in all areas of mathematics.
  - (2) Format. The contest will consist of objective questions designed to test knowledge and understanding in the areas of general math, algebra I and II, geometry, trigonometry, math analysis, analytic geometry, probability, pre-calculus and elementary calculus.
  - (3) Calculators. Refer to the contest handbook for restrictions on calculator.
- (b) ENTRIES.
  - (1) Individual Competition. Each member high school may enter as many as four individuals in the district meet.
  - (2) Team Competition. A school shall have a minimum of three contestants compete in order to participate in the team competition. All four members of the winning team will advance to the next higher level of competition.
- (c) QUALIFICATION. Individuals, team and wild cards qualify for the next level of competition according to Section 902.
- (d) TIES.
  - (1) Individual Competition. In the event of a tie, the formula for percent accuracy shall be used to break the tie. The formula is: percent accuracy equals number of problems correct divided by number of problems attempted. The contestant with the highest percent accuracy shall be awarded the higher place. If the percent accuracy scores are the same, then a tie exists.
  - (2) Team Competition. Refer to Section 902 (h)(3)(D).

# Mathematics

## Contest Rules and Procedures

1. **CONTEST ROSTER.** A contest roster listing contestants will be created from schools' online entries and provided to the contest director.
2. **NUMBERING CONTESTANTS.** Each contestant will be assigned a number. This number should be indicated on the contest roster and included on the contestant's test and answer sheet. Contestants shall not write their name or the name of their school on their answer sheets.
3. **ROLL CALL.** The contest director will call roll from the contest roster and replace any contestant who is not present with a certified substitute at district or the certified alternate or team substitute at regional and state. All persons except participating contestants, the contest director, assistants and monitors will be dismissed from the room before the contest begins.
4. **SUBSTITUTIONS AND ALTERNATES.** Schools may replace individual contestants on the official district meet roster with a substitute so long as the substitute presents the contest director with the appropriate documentation. Alternates may compete at region and state only in the absence of an individual who won first, second or third place in the preceding competition. If a member of a school's team cannot compete at region or state, only one substitution may be made. See the UIL Constitution and Contest Rules Sections 903-905 for clarification.
5. **SEATING.** Contestants will be seated sparsely around the room and away from other contestants from the same school.
6. **LATE ARRIVAL.** Except in emergencies, the UIL does not recommend allowing contestants to enter the room after this contest has begun. The decision to allow late entry rests with the contest director of the meet.
7. **CALCULATORS.** Students may use calculators. Contestants will be allowed the use of any commercially available silent hand-held calculators provided they do not require auxiliary electric power and are not modified. Each student may bring one spare calculator. Hand-held computers are not permitted. Memory should not be cleared.
8. **TEST DISTRIBUTION.** Testing materials will be distributed and contestants shall not open the test prior to instructions from the contest director. The assigned contestant number should be written in the top right-hand corner of the test cover page and answer sheet.
9. **SCRATCH PAPER.** Contest directors shall provide contestants with at least three sheets of scratch paper to be distributed with the test and answer sheet. Contestants are permitted to write on the exam and on the scratch paper.
10. **ANNOUNCEMENTS.** Following roll call and prior to the start of the test, contest directors shall read aloud to contestants the section of this handbook titled Announcements Prior to Conducting the Contest.
11. **START AND STOP SIGNALS.** Contest directors should give a clear signal to start. After

exactly 40 minutes, the contest director will give the verbal notification to stop. No other time warnings shall be given. A clock should be provided to indicate the remaining time in the contest at a position easily seen by all contestants. If all contestants agree to its absence, the clock may be omitted. When the signal to stop is given, contestants should stop immediately, put writing implements down, sit back and refrain from handling anything on their desks until the tests, answer sheets and scratch paper are collected.

12. **TIMING AND ELECTRONIC DEVICES.** Contestants may use timing devices provided they do not emit audible signals during the contest. Cell phones, tablets, smart watches or any device that can wirelessly connect to the Internet, may not be used during the contest. Music players, headphones, etc. may not be used in the testing room. Electronic devices not allowed in the contest should be turned off and should not be accessible during testing. Emission of audio signals of any kind during the contest will result in disqualification.
13. **ANSWER SHEETS.** Answers shall be written on the answer sheet in capital letters. Answers not written as capital letters will be graded as being incorrect. Contestants should not use the answer sheet for calculations or other marks. Graders will not consider answers written on the test or scratch paper.
13. **LEGIBILITY.** If a consensus of graders cannot read an answer, they will mark that answer as incorrect.
14. **TURNING IN PAPERS.** Contestants shall remain seated and retain their papers during the 40-minute testing period, except in the case of a medical or other emergency. In that event, the student shall receive permission to leave the contest room and shall be accompanied by a monitor while outside the contest room. Students who leave and return to the contest room without permission shall be disqualified.
15. **GRADERS.** Coaches are expected to serve as graders and should be selected by the contest director prior to the beginning of the contest. One grader will be designated as the Head Grader.
16. **ANSWER KEY.** Prior to the start of grading, the Head Grader should communicate to the contest director any concerns of the graders and any suggested changes to the key.
17. **ANSWER KEY ERRORS.** In the case of a suspected error on the answer key, the contest director should contact the UIL State Office and/or contact the state contest director to communicate the suspected error and to seek clarification before changing the key. Any error confirmed by the UIL State Office or the state contest director should be corrected on the key used for grading.
18. **GRADING THE CONTEST.** Each paper should be independently scored twice, and papers contending to place should be scored a third or fourth time as needed.
19. **SCORING.** Six points shall be awarded for all questions answered correctly, no points shall be given or subtracted for unanswered questions, and two points shall be deducted for an incorrect answer.
20. **PLACES AND TIES.** Contestants can qualify to the next level of competition as individual first, second and third place winners or members of the winning team or wild card team according to Section 902 of the UIL Constitution and Contest Rules.
  - a. Individual Competition. First place is awarded to the contestant making the highest total score, second place to the contestant making the next highest, third place to

the next highest and so on. Ties shall be broken according to Section 942 of the UIL Constitution and Contest Rules.

- b. **Team Competition.** The sum of the top three scores from each school constitutes the team score for the school. First place is awarded to the team with the highest team score and second place to the team with the next highest. Team ties shall be broken according to Section 902 (h)(3)(D) of the UIL Constitution and Contest Rules. All team members who qualify to regional or state will compete for individual honors.
- c. **Wild Card.** A wild card team will advance according to Section 902 of the UIL Constitution and Contest Rules.

- 21. **VERIFICATION PERIOD.** Following grading and input of unofficial results into the online entry system, contestants and coaches shall be allowed a time period to review contest materials (see After the Contest, Verification Period). Questions shall be resolved during the Verification Period. Contestants and coaches not present at verification waive their opportunity to ask questions and accept final results as official.
- 22. **ANNOUNCING OFFICIAL RESULTS.** Following the verification period, the contest director should announce, as official, the names and schools of contestants through sixth place and the top two teams. Official results, once announced, are final.
- 23. **NOTIFYING ALTERNATES.** If an individual qualifier cannot compete at the next higher meet, the alternate shall be notified and allowed to compete. If a member of a school's team is unable to compete at the next higher level of competition, only one substitution may be made. The substitute shall give the contest director a substitute eligibility form or a letter certifying eligibility, signed by a school administrator.
- 24. **RETURNING THE PAPERS.** When results are final and all test questions resolved, district papers may be returned no sooner than the end of the last contest day of the district week. Regional papers may be returned no sooner than Saturday of region weekend.
- 25. **CONFIDENTIALITY.** Coaches, contest directors and contestants shall maintain confidentiality of contest material until the official release date. Transfer of information relative to the test shall be considered a violation of the Academic Contest Ethics Code and subject to penalties as outlined in the UIL Constitution and Contest Rules.
- 26. **SWEEPSTAKES POINTS.** Points are awarded through sixth place and to first and second place teams according to Section 902 of the UIL Constitution and Contest Rules.

# BEFORE THE MEET

## ROOM

Secure a room adequate in size, with quietness of location and excellent lighting as prime factors. The UIL recommends tables with accompanying chairs (without arms) or flat top desks.

## MATERIALS AND EQUIPMENT

The contest director will provide the following:

- At least two blank sheets of paper for each contestant. It is recommended that the blank sheets be placed in the test just behind the cover page before distributing the tests.
- Pens for grading (Contestants provide their own pencils.)
- Accurate clock for timing and clock which contestants can see during the contest (optional)
- (DISTRICT) One 8 ½ x 11 envelope per school entered, for returning materials

## CONTEST PACKET

The League office will provide the following:

- A copy of the UIL Mathematics Handbook
- Sufficient copies of the tests and answer keys
- Answer sheets
- (REGION) State Meet information cards for state meet qualifiers (11)

The meet director may schedule a specific time and place for contest directors to pick up test packets before the contest. Contest officials should inventory the contents before the contest. The packet should be checked to verify the correct materials are enclosed and the number of copies included is sufficient for the number of competitors. The test packet should then be resealed and not opened again until just prior to the beginning of the contest.

## PERSONNEL

Coaches of competitors may serve as contest directors, assistants, monitors and graders.

- Contest director.
- Assistant to the contest director.
- Room Monitor.
- Graders. Almost certainly the best graders will be coaches of contestants, and we encourage using their skill and experience to ensure accurate and efficient grading of the test papers. Designate one grader as the Head Grader. Make these selections prior to the beginning of the contest.

## TIME

Allot at least one hour for the contest (an hour and a half is preferable). Plan for at least 30 minutes for announcements, grader sign up, approval of calculators, roll call, instructions and distribution/collection of materials. Forty minutes of working time will be allotted for the actual testing period exclusive of time required for instructions. The 40 minutes begins when contestants are instructed to start. It is critical to stay on schedule, as some students may need to go to other events.

Arrange for and announce during the opening remarks the time and place of the verification period prior to the announcement of official results.

### **CONTEST ROSTER AND RESULTS WORKSHEET**

Obtain a copy of the contest roster from the meet director, which will be generated from the UIL Spring Meet Online Entry System. It will list the school, contestant number, contestant name, district or region number and will indicate students who are competitors and alternates. Also record scores and/or results on this form to give to the meet director, who will enter the results/scores into the online system before verification is held for the event.

### **ORGANIZING MATERIALS**

Each contestant will be assigned a number indicated on the contest roster. As an example, the number will be listed on the roster as 6A-17 or 2A-4, indicating the conference and a number. The UIL recommends numbering the tests and answer sheets before the contest begins. Write the contestant number in the upper right-hand corner of the test. Check all tests to ensure that all pages are printed clearly and completely. Batch together a test booklet, answer sheet and two pieces of scratch paper that can easily be handed out once contestants are seated.

(REGION) If there is more than one conference at the meet, it is important to differentiate contestant numbers by conference.

### **SORTING ENVELOPES (DISTRICT)**

Provide and label a large (8 1/2 x 11) envelope for each school entered in the district meet. Write the name of the school and contest on the top of the envelopes. After the verification period, contestants' tests and keys should be placed in the appropriate envelope for return to each school.



# CONDUCTING THE CONTEST

1. Set up the room so that contest officials can sit in view of the contestants.
2. Organize contest materials for easy distribution.
3. Call roll from the roster and provide students with their assigned contestant number. Replace any contestant who is not present with a certified substitute at district and the certified substitute or alternate at regional.
4. Seat the contestants sparsely around the room separating contestants from the same school.
5. Dismiss from the contest room all individuals, except the contestants, contest director and assistants. Instruct graders to report to the grading room before the test begins.
6. After reading parts a, b, and c of the following announcements, distribute the tests with the scratch paper and answer sheets. Caution contestants not to open the test until instructed.
7. Read the remaining announcements.

## **Announcements Prior to Conducting the Contest**

- a. Do not open the test until instructed to do so.
- b. Your desk shall remain clear except for two approved calculators, writing implements, and a timing device (optional). Cell phones, Smart watches, iPods, or other similar devices are not to be used as timers and are not to be visible during the contest. The emission of any audio signals of any kind during the contest will result in disqualification.
- c. You will be allowed the use of calculators on this test. A spare calculator is permitted but shall be placed on the work area before the contest begins.
- d. Write the assigned contestant number in the top right-hand corner on the cover page of the test and on the answer sheet. Check for accuracy if the contestant number has already been written on the test and/or answer sheet.
- e. You may write on the test paper and on the scratch paper provided, but only the answer should be written on the answer sheet. Write only in capital letters. Answers not written as capital letters will be graded as incorrect.
- f. This is a 40-minute contest. No oral time warnings will be given. Remain in your seat throughout the testing period and retain your paper until told to do otherwise. You may use this time to check your answers.
- g. During the 40-minute contest period, no questions may be asked or answered.
- h. When the end of the contest period is indicated, contestants should stop immediately, put their pencils down, sit back, and leave everything on their desk alone until the test, answer sheet, and scratch paper are collected.
- i. The test cover sheet illustrates how answers should be written.
- j. All problems completed or attempted will be graded. A problem is considered to have been attempted if any mark other than a mark out appears in the answer space for that problem. A mark out or erasure must be completely marked out or erased, otherwise it will be considered as an attempted problem and counted as being incorrect.
- k. Verification period will be held in \_\_\_\_\_(name room) at \_\_\_\_\_(give time). This is

contestants' and coaches only time to verify grading and unofficial results.

- l. Are there any questions?
  - m. You may begin the contest.
8. After exactly 40 minutes from the start signal, the director should, without warning, give the signal to stop. Contestants should put down their writing implement and sit back while the tests are collected.
  9. Collect all tests, answer sheets and scratch paper. Scratch paper should be destroyed.
  10. Deliver all materials to the grading room.
  11. Submit the substitution forms/letters to the meet director to update the original entry in the online entry system.

# GRADING THE CONTEST

## **GRADERS**

Graders should report to the grading room as soon as the contest begins. The Head Grader will provide answer keys and surplus tests. Persons not assigned to grade should not enter the grading room.

Graders should review the test and verify the official answer key. The purposes of the review is to verify the official key. See Answer Key Errors. Problems should not be altered in any way or discarded without a ruling from the UIL state office and/or the respective state contest director.

Teams advancing to the Region and State Meet shall provide a qualified grader to score papers, unless excused for a valid reason by the contest director.

## **GRADING INSTRUCTIONS**

Do not sacrifice accuracy for speed. Score each paper independently twice, and score papers contending to place a third or fourth time as needed.

When marking the answer sheets, no mark should be made if the item is correct. Place an X over the question number that is incorrect. Do not mark over the contestant's answer. Do not write the correct answer if the answer written is incorrect. If any answer space is left blank, draw a line through the blank.

## **SCORING**

Score points according to the guidelines in Mathematics Contest Rules and Procedures.

## **PLACES AND TIES**

Refer to Mathematics Contest Rules and Procedures.

## **IDENTIFYING PAPERS**

After papers have been ranked, indicate on the answer sheet the name and school of the student that corresponds with the contestant number. This will expedite the verification process.

# AFTER THE CONTEST

## REPORT TO MEET DIRECTOR

Individual contest directors shall give the contest roster/results form to the district director immediately after the contest papers are scored. The district meet director is responsible for entering results into the online entry system. All scores must be entered into the online entry system prior to verification and announcement of results. Enter all contestants' scores, not just the top six. All scores are needed to determine team results. Provide at least one copy of the unofficial results from the online entry system during verification.

## VERIFICATION PERIOD

Announce that no one present may use writing or erasing instruments during the verification period. If the key was changed during the grading process (with the approval of the UIL state office or the state contest director), the contest director shall announce the changes made. The contest director shall allow the contestants and coaches a time period not to exceed 15 minutes to look at all of the following items:

- Contestant's test and answer sheet
- An answer key, in its original form as supplied by the League office
- Display of scores after entry into the UIL Spring Meet Online Entry System

Do not allow anyone to take papers from the room. During this period, the contestants and/or coaches shall verify that they have the correct papers and look for possible errors in the grading, calculation or data entry of scores.

Display each contestant's score (not just the top 6 places) preferably by displaying the printed page from the online scoring system after scores were entered. This will allow data entry of score to be reviewed by contestants and coaches during the Verification Period.

At state meet only, the contest director may omit a display of data entry into the UIL Spring Meet Online Entry System if data entry has been carefully reviewed and verified by graders or other assistants during the grading and scoring period.

If errors in grading, scoring or online data entry are found during the verification period, the contest director shall make the corrections.

After resolving all questions, or the end of the 15 minutes, the contest director should announce that the Verification Period has ended. If papers are not being returned on the day of the contest, see Returning Papers below.

## ANNOUNCING OFFICIAL WINNERS

The contest director should make any necessary announcements regarding the return of papers if necessary and any instructions regarding the awards ceremony. The contest director will announce official results with the name and the school of each contestant who places

individually first through sixth and announce the schools of the first place and alternate teams. These results, once announced as official, shall be final.

# MATHEMATICS QUICK REFERENCE CHART

Note: Grading time varies. For most events, allocate a minimum of two hours.

<b>Contest</b>	<b>Study Material</b>	<b>Calculator Restriction</b>
<p><b>ROOMS</b> 1 – testing 1 – grading</p> <p>PREPTIME — 20 TEST TIME — 40</p> <p><b>CONTEST MATERIALS</b> UIL Packet: tests &amp; keys, answer blanks, rubrics.</p> <p>Director Provides: contest roster and results form (generated from online entry system), contest rules, clock, 8 1/2 x 11-inch scratch paper, pencils for graders, stapler, and one 8 1/2 x 11-inch envelope per school.</p> <p><b>PERSONNEL</b></p> <ul style="list-style-type: none"><li>• Director</li><li>• One assistant</li></ul> <p><b># OF ENTRIES</b> (District) 4 per school (Region) 1st/2nd/3rd individuals per district; 1st place team per district; wild card team.</p> <p><b>TIES</b></p> <ul style="list-style-type: none"><li>• Individual — The formula for percent accuracy shall be used to break the tie. Percent accuracy = number of problems correct divided by the number of problems attempted. If percent accuracy scores are the same, then a tie exists.</li><li>• Team — Break tie with fourth team member score. If tie still exists, all teams involved in tie advance.</li></ul> <p><b>GRADING/JUDGES</b> At least 3, preferably more. Graders may be coaches.</p> <p><b>AWARDS</b> Individual medals: 1<sup>st</sup> through 6<sup>th</sup> Team medals: 1<sup>st</sup> and 2<sup>nd</sup> place teams</p> <p><b>POINTS</b> 1<sup>st</sup> — 15 2<sup>nd</sup> — 12 3<sup>rd</sup> — 10 4<sup>th</sup> — 8 5<sup>th</sup> — 6 6<sup>th</sup> — 4</p> <p>1<sup>st</sup> team — 10 2<sup>nd</sup> team — 5</p> <p><b>ADVANCE</b> Top 3 individuals and 1st place team. One wild card team per regional will also advance.</p>	<p>Shop the UIL Online Store at <a href="http://store.uiltexas.org">store.uiltexas.org</a> to purchase study Materials. Some materials are available for free download.</p> <ul style="list-style-type: none"><li>• Mathematics study packet includes the prior year's tests.</li></ul> <p>The Academics homepage of the UIL web site contains a variety of additional forms needed for academic programs, including the Professional Acknowledgment Form for all sponsors, coaches and directors of academic events and the Substitute Eligibility Form needed for contestants not listed on the original entry form for UIL meets.</p> <p>The Mathematics Handbook includes a description of the current UIL contest format, rules and procedures. It is available as a free download: <a href="http://www.uiltexas.org/academics/resources/contest-handbooks-manuals">http://www.uiltexas.org/academics/resources/contest-handbooks-manuals</a></p> <p>The generic forms needed to host invitational meets, such as grading rubrics, answer sheets and contest results form are posted, as are the Academic Meet Director Manual, the conflict pattern and various checklists for academic Coordinators. Check the different web pages for speech and debate, theatre, and the A+ Program for current information and forms specific to those contests.</p>	<p>Contestants will be allowed the use of any commercially available silent, hand-held calculators that do not require auxiliary electric power and as long as they are not modified.</p> <p>Each student may bring one spare calculator. Small, hand-held computers are not permitted.</p> <p>DO NOT request that contestants clear the memory.</p>



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