

## JOB Information & Rules

### PURPOSE

The purpose of the John O'Bryan Mathematics competition is to stimulate interest in mathematics among high school students in Northern Kentucky and recognize outstanding mathematical achievement among those students.

### ELIGIBILITY

Any high-school whether public or private located in the Kentucky counties of Boone, Kenton, Campbell, Gallatin, Grant, Pendleton, or Bracken may participate in this contest. Additionally any group of home-school students from these counties may also participate.

Grade level designations are interpreted as follows:

Junior-Senior: Any student in Grades 11 – 12

Freshman-Sophomore: Any student in Grades 9-10

Any student may participate at or above his/her grade level, but not below his/her grade level. For example a freshman may take the Junior-Senior written exam, but a senior may not take the Freshman-Sophomore exam.

### EXPECTATION OF CONDUCT

Students and coaches are expected to behave with integrity and team spirit – ethical misconduct will not be tolerated. Coaches are responsible for the conduct of their teams and should remain with their teams as much as possible. Each team should have an attending coach/parent or other responsible adult present during the competition. Should conduct fall below expected standards, the contest chairs may choose from among options including disqualification, exclusion from future contest(s), and/or notification of the offending school's chief administrator.

### DATE OF CONTEST

The John O'Bryan competition is generally held on a Saturday in November each year. The contest is generally scheduled from 9:00 AM to 11:50 AM with the awards ceremony being held around 12:30 PM.

### REGISTRATION

Schools may field up to three separate teams of five students each. Coaches should specify one team as the "varsity team" while additional teams will be considered "junior-varsity" teams.

Teams of fewer than five are allowed; however no accommodations to scoring are made having fewer teammates. Registrations should be submitted at least two weeks prior to the contest, but may be accepted later at the discretion of the contest chairs. Changes to registration information are permissible on-site up to 9:15 AM on the morning of the contest. Scores of students not listed on a team's registration roster for any given event will not be counted.

## SPECIAL NEEDS

The contest chairs reserve the right to make special provisions in exceptional cases or to comply with laws pertaining to students with special needs. Coaches must notify the contest chairs of any special needs. Notification should be in writing and received by the registration deadline and fully justify any special provisions requested. The participating school will be responsible for any and all additional costs incurred in meeting the special needs of the student.

## THE OVERALL COMPETITION

The Varsity level of the John O'Bryan competition consists of three scoring components:

1. Team Competition (9:30 – 10:10 AM, 60 points possible)
2. Individual Competition (10:20 – 11:10 AM, 60 points possible)
3. Two-person Speed Competition (11:20 – 11:50 AM, 30 points possible, Varsity only)

The team earning the most total combined points from these three competitions will be declared the winner. In the event of a tie, the tie will be broken if possible by using the team competition score – and if that is tied, the individual competition score – as tiebreakers. Additionally, awards are given to the best teams and students within each component of the contest.

Junior varsity teams participate in the team and individual competitions only. They remain eligible for all awards related to these competitions; and additionally the two highest performing junior varsity teams for component will be recognized.

It is not required that a school field students in all parts of the competition in order to participate. For example a school might have only two students wishing to compete. They might choose to compete only in the individual competition (for individual awards) and as a two-person team.

## CALCULATORS

All portions of the competition allow the use of calculators. For the purpose of this contest, to be defined as a calculator, equipment must be battery operated, unable to connect to internet Wi-Fi, and may not utilize a standard QWERTY keyboard. Any questions as to whether specific calculators will be allowed may be directed to the contest chairs, whose decision is final.



## TEAM COMPETITION

In the team competition, all five members of the team work together in an attempt to solve six equally weighted problems.

- The problems may be divided among teammates in any way the team desires; teams have 40 minutes to complete solutions to any or all of the problems.
- All solutions submitted require appropriate justification to receive credit. A proof, or other clear explanation, must be provided for each answer.
- Calculator output may be used to understand a problem or check an answer, but should not be included as part of a final written answer.
- Partial credit will be given, but only for significant progress toward a solution.
- Teams should hand in only work to be graded; **each page must contain the team code as well as the problem number in the upper left hand corner. All problems should be worked on separate sheets of paper.** Scratch work should NOT be included as extraneous or incorrect work submitted may reduce the score for that problem.

Team competition papers will be scored by mathematics faculty from NKU.

## INDIVIDUAL COMPETITION

The individual competition consists of a 20-question mathematics test. Students will have fifty minutes to work as many questions as possible.

- Students may compete at the freshman-sophomore level or the junior-senior level, as appropriate (juniors and seniors may not take the freshman-sophomore test).
- The team score shall be determined by the sum of the best three individual student scores such that at least two scores from the junior-senior exam are included (i.e. only one freshman-sophomore exam score may be counted toward the team total).
- Students must record their answer to each question on the provided answer-sheet, which shall also include their name and team code.
- All answers must be written legibly on the correct blanks of the answer sheet. Scores are based on exact, complete, simplified answers only. If the question specifies a form for the answer, correct answers will only be accepted in the specified form. No work need be shown and no partial credit is given. Simplified means:
  - Fractions are reduced to lowest terms (the use of horizontal fraction bars instead of slash marks is highly encouraged; ambiguous answers, such as  $8/3x$ , will be considered incorrect). Improper fractions are preferable to mixed numbers (which can become ambiguous).
  - Radical expressions are found in the numerator of a fraction only.
  - Units of measurement are not required in the answer and should not be given.
  - Scientific notation should not be used for answers expressed in decimal form.
  - Specific instructions in a given problem take precedence over all of the above.

## TWO-PERSON SPEED COMPETITION

Two students from each *varsity* team may be chosen by their coaches to participate in this competition (which replaces the quick-recall competition from past years and now counts in the scoring). In this competition, a sequence of eight mathematical problems are flashed one at a time on a projector screen. The two students from each team work together to submit the correct answer in the fastest time.

- The pair of students for the two-person speed competition may consist of any combination of grade levels (including two seniors).
- Teams may only submit one answer to each problem. An answer is submitted by folding the answer sheet vertically in half and holding it above one's head. Scores are based on exact, complete, simplified answers only (as in the individual competition). Proctors in the room will check the answers for each team and record scores.
  - The first correct answer submitted for each problem scores 7 points.
  - The second correct answer submitted for each problem scores 5 points.
  - All other correct answers within a maximum of three minutes per problem score 3 points.
- If the competition results in a tie for first place after eight rounds, up to three tie breaking questions will be used in an attempt to break the tie. Only those teams involved in the tie will participate in a tiebreaker. If the tie is not broken after two rounds because no correct answers are submitted, then the result will remain a tie. Tie-breaking questions will not count toward a team's overall score.
- If there are more than 12 teams participating in this part of the competition, teams may be divided into two "rooms" at the discretion of the contest chairs. Each room would be scored according to the above mechanism.
- If the highest scoring team in the two-person speed competition exceeds 30, all scores will be scaled such that the highest score counting toward overall results will be 30.

## AWARDS

Awards will be given on three levels: (1) School Overalls, (2) Competition Segments, and (3) Individual Exam. An abbreviated list is as follows:

- The top five varsity teams will be recognized. Points from all three segments of competition will be added together to determine this ranking.
- For each segment of competition, the top three teams will be recognized. Additionally for the individual and team competitions, the top two junior varsity teams will be recognized (for the JV award only, the top three scores from the individual competition will be summed regardless of level).
- For the individual Junior-Senior competition, the top ten students will be recognized.
- For the individual Freshman-Sophomore competition, the top five students will be recognized.

## CONTEST CHAIRS

Contest chairs are designated by the NKU department of Mathematics and Statistics. Any ambiguity or decision not covered in these rules may be addressed as needed by the contest chairs. All decisions of the contest chairs are final.