

## Additional Rules

**All answers must be legible.**

**Pencils and paper** will be provided for Mathletes by competition organizers. However, students may bring their own pencils, pens and erasers if they wish. They may not use their own scratch paper.

**Use of notes or other reference materials** (including dictionaries) is not permitted.

**Specific instructions stated in a given problem** take precedence over any general rule or procedure.

**Communication with coaches is prohibited during rounds but is permitted during breaks.** All communication between guests and Mathletes is prohibited during competition rounds. Communication between teammates is permitted only during the Team Round.

**Calculators are not permitted in the Sprint or Countdown Rounds, but they are permitted in the Target, Team and Masters Rounds.** Where calculators are permitted, students may use any calculator (including programmable and graphing calculators) that does not contain a QWERTY (i.e., typewriter-like) keypad. Calculators that have the ability to enter letters of the alphabet but do not have a keypad in a standard typewriter arrangement are acceptable. **Personal digital assistants (e.g., Palm Pilots®) are not considered to be calculators and may not be used during competitions. Students may not use calculators to exchange information with another person or device during the competition.**

Coaches are responsible for ensuring that their students use acceptable calculators, and students are responsible for providing their own calculators. Coordinators are not responsible for providing Mathletes with calculators, AC outlets or batteries before or during MATHCOUNTS competitions. Coaches are strongly advised to bring backup calculators and spare batteries to the competition for their team members in case of a malfunctioning calculator or weak/dead batteries. Neither the MATHCOUNTS Foundation nor coordinators shall be responsible for the consequences of a calculator's malfunctioning.

**Pagers, cell phones, radios and MP3 players should not be brought into the competition room.** Failure to comply could result in dismissal from the competition.

Should there be a **rule violation or suspicion of irregularities**, the MATHCOUNTS coordinator or competition official has the obligation and authority to exercise his/her judgment regarding the situation and take appropriate action, which might include disqualification of the suspected student(s) from the competition.

## Forms of Answers

The following list explains acceptable forms for answers. Coaches should ensure that Mathletes are familiar with these rules prior to participating at any level of competition. Judges will score competition answers in compliance with these rules for forms of answers.

**All answers must be expressed in simplest form.** A “common fraction” is to be considered a fraction in the form  $\pm \frac{a}{b}$ , where  $a$  and  $b$  are natural numbers and  $\text{GCF}(a, b) = 1$ . In some cases the term “common fraction” is to be considered a fraction in the form  $\frac{A}{B}$ , where  $A$  and  $B$  are algebraic expressions and  $A$  and  $B$  do not share a common factor. A simplified “mixed number” (“mixed numeral,” “mixed fraction”) is to be considered a fraction in the form  $\pm N \frac{a}{b}$ , where  $N$ ,  $a$  and  $b$  are natural numbers,  $a < b$  and  $\text{GCF}(a, b) = 1$ . Examples:

*Problem:* Express 8 divided by 12 as a common fraction.      *Answer:*  $\frac{2}{3}$       *Unacceptable:*  $\frac{4}{6}$   
*Problem:* Express 12 divided by 8 as a common fraction.      *Answer:*  $\frac{3}{2}$       *Unacceptable:*  $\frac{12}{8}, 1\frac{1}{2}$   
*Problem:* Express the sum of the lengths of the radius and the circumference of a circle with a diameter of  $\frac{1}{4}$  as a common fraction in terms of  $\pi$ .      *Answer:*  $\frac{1+2\pi}{8}$   
*Problem:* Express 20 divided by 12 as a mixed number.      *Answer:*  $1\frac{2}{3}$       *Unacceptable:*  $1\frac{8}{12}, \frac{5}{3}$

**Ratios should be expressed as simplified common fractions** unless otherwise specified. Examples:

*Simplified, Acceptable Forms:*  $\frac{7}{2}, \frac{3}{\pi}, \frac{4-\pi}{6}$       *Unacceptable:*  $3\frac{1}{2}, \frac{1}{3}, 3.5, 2:1$

**Radicals must be simplified.** A simplified radical must satisfy: 1) no radicands have a factor which possesses the root indicated by the index; 2) no radicands contain fractions; and 3) no radicals appear in the denominator of a fraction. Numbers with fractional exponents are *not* in radical form. Examples:

*Problem:* Evaluate  $\sqrt{15} \times \sqrt{5}$ .      *Answer:*  $5\sqrt{3}$       *Unacceptable:*  $\sqrt{75}$

**Answers to problems asking for a response in the form of a dollar amount or an unspecified monetary unit (e.g., “How many dollars...,” “How much will it cost...,” “What is the amount of interest...”) should be expressed in the form (\$)  $a.bc$ , where  $a$  is an integer and  $b$  and  $c$  are digits.**

The *only* exceptions to this rule are when  $a$  is zero, in which case it may be omitted, or when  $b$  and  $c$  are both zero, in which case they may both be omitted. Examples:

*Acceptable:* 2.35, 0.38, .38, 5.00, 5      *Unacceptable:* 4.9, 8.0

**Units of measurement are not required in answers, but they must be correct if given.** When a problem asks for an answer expressed in a specific unit of measure or when a unit of measure is provided in the answer blank, equivalent answers expressed in other units are not acceptable. For example, if a problem asks for the number of ounces and 36 oz is the correct answer, 2 lbs 4 oz will not be accepted. If a problem asks for the number of cents and 25 cents is the correct answer, \$0.25 will not be accepted.

**Do not make approximations for numbers** (e.g.,  $\pi$ ,  $\frac{2}{3}$ ,  $5\sqrt{3}$ ) in the data given or in solutions unless the problem says to do so.

**Do not do any intermediate rounding** (other than the “rounding” a calculator performs) when calculating solutions. All rounding should be done at the end of the calculation process.

**Scientific notation** should be expressed in the form  $a \times 10^n$  where  $a$  is a decimal,  $1 \leq |a| < 10$ , and  $n$  is an integer. Examples:

*Problem:* Write 6895 in scientific notation.      *Answer:*  $6.895 \times 10^3$   
*Problem:* Write 40,000 in scientific notation.      *Answer:*  $4 \times 10^4$  or  $4.0 \times 10^4$

**An answer expressed to a greater or lesser degree of accuracy than called for in the problem will not be accepted. Whole number answers should be expressed in their whole number form.**

Thus, 25.0 will not be accepted for 25 nor vice versa.

**The plural form of the units will always be provided in the answer blank, even if the answer appears to require the singular form of the units.**

## Scoring

Scores on the competition do not conform to traditional grading scales. Coaches and students should view an individual written competition score of 23 (out of a possible 46) as highly commendable.

**The individual score** is the sum of the number of Sprint Round questions answered correctly and twice the number of Target Round questions answered correctly. There are 30 questions in the Sprint Round and 8 questions in the Target Round, so the maximum possible individual score is  $30 + 2(8) = 46$ .

**The team score** is calculated by dividing the sum of the team members' individual scores by 4 (even if the team has fewer than four members) and adding twice the number of Team Round questions answered correctly. The highest possible individual score is 46. Four students may compete on a team, and there are 10 questions in the Team Round. Therefore, the maximum possible team score is 66 since  $((46 + 46 + 46 + 46) \div 4) + 2(10) = 66$ .

If used officially, the Countdown Round yields final individual standings. The Masters Round is a competition for the top-scoring individuals that yields a separate winner and has no impact on progression to the National Competition.

**Ties will be broken** as necessary to determine team and individual prizes and to determine which individuals qualify for the Countdown Round. For ties among individuals, the student with the higher Sprint Round score will receive the higher rank. If a tie remains after this comparison, specific groups of questions from the Sprint and Target Rounds are compared. For ties among teams, the team with the higher Team Round score, and then the higher sum of the team members' Sprint Round scores, receives the higher rank. If a tie remains after these comparisons, specific questions from the Team Round will be compared. *Note:* These are very general guidelines. Please refer to the "General Instructions" accompanying each competition set for detailed procedures should a tie occur.

In general, questions in the Sprint, Target and Team Rounds increase in difficulty so that the most difficult questions occur near the end of each round. The comparison of questions to break ties generally occurs such that those who correctly answer the more difficult questions receive the higher rank.

**Protests concerning the correctness of an answer** on the written portion of the competition must be registered with the room supervisor in writing by a coach within 30 minutes of the end of each round. Rulings on protests are final and may not be appealed. Protests will not be accepted during the Countdown or Masters Rounds.

## Results Distribution

Coaches should expect to receive the scores of their students, anonymous rankings of all scores and a list of the top 25% of students and top 40% of teams from their coordinator. In addition, single copies of the blank competition materials and answer keys may be distributed to coaches after all competitions at that level nationwide have been completed. ***Coordinators must wait for verification from the national office that all such competitions have been completed before distributing blank competition materials and answer keys.*** Both the problems and answers from Chapter and State competitions will be posted on the MATHCOUNTS Web site following the completion of all competitions at that level nationwide (Chapter – early March; State – early April). The previous year's problems and answers will be taken off the Web site at that time.

Student competition papers and answers will not be viewed by nor distributed to coaches, parents, students or other individuals. Students' competition papers become the confidential property of the MATHCOUNTS Foundation.