

## Forms of Answers

The following list explains acceptable forms for answers. Math Stars coaches should ensure that Math Stars competitors are familiar with these rules prior to participating at any level of competition. Judges and markers will score competition answers (to all short-answer problems) 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  $\gcd(a, b) = 1$ . 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  $\gcd(a, b) = 1$ . 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:*  $1\frac{5}{3}$

*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. Answers in the form (\$) $a.bc$  should be rounded to the nearest cent unless otherwise specified. Examples:

*Acceptable:* 2.35, 0.38, .38, 5.00, 5

*Unacceptable:* 4.9, 8.0

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

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

**Scientific notation** should be expressed in the form  $a \times 10^n$  where  $a$  is a decimal,  $1 < |a| < 10$ , and  $n$  is an integer. If  $a$  can be expressed as an integer, either  $a \times 10^n$  or  $a.0 \times 10^n$  will be accepted. 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, and 25 will not be accepted for 25.0.

**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 amount in kilograms and 2 kg is the correct answer, 2000 g 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.

**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.**

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