

## RELATED TECHNICAL MATH

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### PURPOSE

To evaluate the contestant's understanding and ability to solve mathematical problems commonly found in the skilled trades, professional and technical occupations.

First, download and review the General Regulations at: <http://updates.skillsusa.org>.

### ELIGIBILITY

Open to active SkillsUSA members.

### CLOTHING REQUIREMENTS

#### Class E: Contest specific — Business Casual

- Official SkillsUSA white polo shirt.
- Black dress slacks (accompanied by black dress socks or black or skin-tone seamless hose) or black dress skirt (knee-length, accompanied by black or skin-tone seamless hose).
- Black leather closed-toe dress shoes.

These regulations refer to clothing items that are pictured and described at:

[www.skillsusastore.org](http://www.skillsusastore.org). If you have questions about clothing or other logo items, call 1-888-501-2183.

**Note:** Contestants must wear their official contest clothing to the contest orientation meeting.

### OBSERVER RULE

Observers will be allowed to view the test. No talking or gesturing with contestants or any disruptive noise will be permitted.

### EQUIPMENT AND MATERIALS

1. Supplied by technical committee:
  - a. Tables and chairs
  - b. Test problems and instructions
  - c. Scratch paper and pencils
  - d. Formula sheets and conversion tables/charts

2. Supplied by the contestant:
  - a. Hand-held calculator
  - b. All competitors must create a one-page résumé and submit a hard copy to the technical committee chair at orientation. Failure to do so will result in a 10-point penalty.

**Note:** Your contest may also require a hard copy of your résumé as part of the actual contest. Check the Contest Guidelines and/or the updates page on the SkillsUSA website at <http://updates.skillsusa.org>.

**Note:** No reference materials may be used other than those provided by the technical committee.

### SCOPE OF THE CONTEST

#### Knowledge Performance

A written knowledge test will be required. A sound knowledge of geometry, algebra, trigonometry and basic statistics will prepare the students to exhibit their problem-solving skills for this part of the contest.

#### Skill Performance

There is no skill performance component of this contest.

#### Contest Guidelines

1. The written knowledge test comprises 50 problems applicable to any career and technical field. It covers applications of the fundamental operations of whole numbers, fractions and decimals, including applications of percentages, ratio and proportion, averages, areas and volumes.
2. The written knowledge test will provide the student the opportunity to demonstrate his or her problem-solving skills, not just mathematical ability.
3. Students have two hours to complete the problems and check their answers.
4. Hand-held calculators may be used. Competitors need nothing more than a simple scientific calculator that can be purchased for about \$10–\$15. A graphing calculator is not necessary. The test is based on real-world mathematical applications and reasoning — not theoretical mathematics.

- No bonus will be given for early completion of the written knowledge test.

## Standards and Competencies

### RTM 1.0 – SkillsUSA Framework



The SkillsUSA Framework is used to pinpoint the Essential Elements found in Personal Skills, Workplace Skills, and Technical Skills Grounded in Academics. Students will be expected to display or explain how they used some of these Essential Elements. Please reference the graphic above, as you may be scored on specific elements applied to your project. For more, visit: [www.skillsusa.org/about/skillsusa-framework/](http://www.skillsusa.org/about/skillsusa-framework/).

The remaining standards and competencies for this contest will be completed by the national technical committee in the next edition of the Technical Standards. In the meantime, visit: [updates.skillsusa.org](http://updates.skillsusa.org) for updates.

### Committee Identified Academic Skills

The technical committee has identified that the following academic skills are embedded in this contest.

#### Math Skills

- Use fractions to solve practical problems.
- Use proportions and ratios to solve practical problems.
- Simplify numerical expressions.
- Use scientific notation.
- Solve practical problems involving percentages.

- Solve single variable algebraic expressions.
- Solve multiple variable algebraic expressions.
- Measure angles.
- Apply Pythagorean Theorem.
- Graph linear equations.
- Solve problems using proportions, formulas and functions.
- Find slope of a line.
- Use laws of exponents to perform operations.
- Solve quadratic equations.
- Solve practical problems involving complementary, supplementary and congruent angles.
- Solve problems involving symmetry and transformation.
- Use measures of interior and exterior angles of polygons to solve problems.
- Find arc length and the area of a sector.

#### Science Skills

None Identified

#### Language Arts Skills

None Identified

### Connections to National Standards

State-level academic curriculum specialists identified the following connections to national academic standards.

- Math Standards.
- Numbers and operations.
- Algebra.
- Geometry.
- Measurement.
- Data analysis and probability.
- Problem-solving.
- Communication.
- Connections.
- Representation.

**Source:** NCTM Principles and Standards for School Mathematics. For more information, visit:

<http://www.nctm.org>.

#### Science Standards

- Understands the nature of scientific inquiry.

**Source:** McREL Compendium of National Science Standards. To view and search the compendium, visit:

<http://www2.mcrel.org/compendium/browse.asp>.

**Language Arts Standards**

None Identified

**Source:** IRA/NCTE Standards for the English Language Arts.  
To view the standards, visit: [www.ncte.org/standards](http://www.ncte.org/standards).