



## RELATED TECHNICAL MATH



SkillsUSA Championships Technical Standards

### PURPOSE

To evaluate the competitor'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. Each state may send one high school and one college/postsecondary competitor.

### CLOTHING REQUIREMENTS

#### **Class E: Competition Specific — Business Casual**

- Official SkillsUSA white polo shirt
- Black dress slacks or black dress skirt (knee-length minimum)
- Black closed-toe dress shoes

*Note:* Wearing socks or hose is no longer required. If worn, socks must be black dress socks and hose must be either black or skin-tone and seamless/nonpattern.

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:* Competitors must wear their official competition clothing to the competition orientation meeting.

## EQUIPMENT AND MATERIALS

1. Supplied by technical committee:
  - a. Test problems and instructions
  - b. Scratch paper
  - c. Formula sheets and conversion tables/charts
2. Supplied by the competitor:
  - a. Hand-held calculator
  - b. No. 2 pencil
  - c. All competitors must create a one-page resume. See “Resume Requirement” below for guidelines.

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

### RESUME REQUIREMENT

Competitors must create a one-page resume to submit online. SkillsUSA national competitors should submit their resume by the deadline published on the competition updates page of our website. The deadline and link for resume submission will be published on <http://updates.skillsusa.org>. Failure to submit a resume will result in a 10-point penalty.

**Your resume must be saved as a PDF file type using file name format of “Last Name\_First Name.”** For example, “Amanda Smith” would save her resume as **Smith\_Amanda**. If you need assistance with saving your file as a PDF, visit [the Adobe website](#) for more information.

**Note:** Check the Competition Guidelines and/or the updates page on the SkillsUSA website at <http://updates.skillsusa.org>.

### PROHIBITED DEVICES

Cellphones, electronic watches and/or other electronic devices not approved by a competition’s national technical committee are **NOT** allowed in the competition area. Please follow the guidelines in each technical standard for approved exceptions. Technical committee members may also approve exceptions onsite during the SkillsUSA Championships if deemed appropriate.

### Penalties for Prohibited Devices

If a competitor’s electronic device makes noise or if the competitor is seen using it at any time during the competition, an official report will be documented for review by the Director of the SkillsUSA Championships. If confirmed that the competitor used the device in a manner which compromised the integrity of the competition, the competitor’s scores may be removed.

## SCOPE OF THE COMPETITION

### KNOWLEDGE PERFORMANCE

A written knowledge test is 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 competition. Competitors are also required to take the SkillsUSA Professional Development Test.

### SKILL PERFORMANCE

Competitors will demonstrate their ability to solve math problems that deal with skilled technical real-world scenarios.

### COMPETITION GUIDELINES

1. The written knowledge test is comprised of 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. A graphing calculator is not necessary. The test is based on real-world mathematical applications and reasoning — not theoretical mathematics.
5. 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, as you may be scored on specific elements applied to your competition. For more, visit: [www.skillsusa.org/who-we-are/skillsusa-framework/](http://www.skillsusa.org/who-we-are/skillsusa-framework/).



The standards and competencies for this competition are established by the national technical committee in the Technical Standards. For contest updates, visit: [updates.skillsusa.org](http://updates.skillsusa.org)

## **COMMITTEE IDENTIFIED ACADEMIC SKILLS**

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

### **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: [www2.mcrel.org/compendium/](http://www2.mcrel.org/compendium/).*

### **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).*