The Office of Student Assessment at the Mississippi Department of Education (MDE) maintains a website that contains important information about the Mississippi Subject Area Testing Program.

The following link contains the Algebra I Test information:
http://www.mde.k12.ms.us/osa

The following resources listed on the web page provide current information for teachers to help students prepare for the Algebra I Subject Area Test.

<table>
<thead>
<tr>
<th>Algebra I Test Resources</th>
<th>2007 Mississippi Mathematics Framework, Revised</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Beginning with 2007–2008)</td>
</tr>
<tr>
<td>Teacher’s Guide—Algebra I</td>
<td></td>
</tr>
<tr>
<td>Test Item Specifications</td>
<td></td>
</tr>
<tr>
<td>Performance Level Descriptors</td>
<td></td>
</tr>
<tr>
<td>Algebra I Formula Chart</td>
<td></td>
</tr>
<tr>
<td>Algebra I Framework Comparison</td>
<td></td>
</tr>
<tr>
<td>Practice Tests</td>
<td></td>
</tr>
<tr>
<td>2007 Mathematics Curriculum Framework, Revised</td>
<td></td>
</tr>
<tr>
<td>Test Blueprint</td>
<td></td>
</tr>
<tr>
<td>Graduation Requirements</td>
<td></td>
</tr>
</tbody>
</table>

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Table of Contents

- Introduction to the SATP2 ........................................... 4
- Overview of the Algebra I Test ................................. 4
- Information about Calculator Use on the Algebra I Test ........................................... 5
- Curriculum Framework ......................................... 6
- Test Specifications ............................................ 8
- Test Blueprint .................................................. 9
- Depth of Knowledge ......................................... 10
- Performance Level Descriptors .............................. 11
- The Formula Chart ........................................... 13
- Samples of Algebra I Test Items ............................ 14
- Interpretation of Score Reports for Algebra I .......... 25
- Glossary of Test Terms ...................................... 30
Introduction to the SATP2

In 1999 the Mississippi Senate approved the Mississippi Student Achievement Improvement Act, which states that standards for high school graduation shall include student “mastery of minimum academic skills as measured by assessments developed and administered by the State Board of Education.” To meet the intent of this legislation, four new subject area tests were developed: Algebra I, Biology I, U.S. History, and English II with a writing component. Students earning a high school diploma must pass all four subject area tests to meet graduation requirements.

Overview of the Algebra I Test

The Algebra I Subject Area Test measures a student’s knowledge of and skill level in applied algebra. There are sixty-five multiple-choice items. Many items contain charts, graphs, or diagrams that the student will use to determine the correct answer. Questions from the following competencies are distributed throughout the test: Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability.

Additional information is provided in this guide to educate teachers about the test development process for the Algebra I Subject Area Test. Our hope is that the material contained in this guide will be useful to Algebra I teachers throughout the state of Mississippi in preparing their students for success on the Algebra I Subject Area Test.
Information about Calculator Use on the Algebra I Test

At the beginning of the course of study, teachers will notify each student that they will need a graphing calculator for the test. Students may either bring their own graphing calculators or use those provided by the school. Sharing calculators between students is prohibited in the same test session. Students may use personal calculators.

Beginning with the 2011–2012 school year, all formulas, applications, and/or programs (including, but not limited to, Zoom Math/Zoom Algebra) must be disabled or removed from the calculators to be used by students during the SATP2 Algebra I exam for first-time test takers. The District Test Security Plan must address the processes and/or procedures to be used to ensure that NO personal calculators used by students during a state assessment administration have any stored formulas, applications, and/or programs.

School districts will be given the authority to allow retesters who participated in the SATP2 Algebra I test administration prior to 2011–2012 to continue to use graphing calculators with formulas, applications, and/or programs under the following conditions:

- Districts must test these students in a room separate from any testing room that is used for first-time test takers in 2011–2012 and thereafter.
- Districts must address these procedures for retesters in the District and School Test Security Plans.

The following chart only applies for students who completed Algebra I prior to the 2011-2012 school year:

<table>
<thead>
<tr>
<th>Allowed</th>
<th>Not Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>• alphanumeric keypads (e.g., TI-83, TI-83 Plus®, TI-84, TI-84 Plus®, HP 38g, ALGEX1.0, FX7400, CFX-9850G Plus, EL-9600C)</td>
<td>• Computer Algebra System (CAS) (e.g., TI-89, TI-92 Plus, TI-Nspire™*, ALGEX2.0, ALGEX2.0 Plus, CFX-9970)</td>
</tr>
<tr>
<td></td>
<td>• QWERTY keyboards (similar to typewriter keyboards, e.g., TI-92)</td>
</tr>
<tr>
<td></td>
<td>• attached electronic pens;</td>
</tr>
<tr>
<td></td>
<td>• printing attachments;</td>
</tr>
<tr>
<td></td>
<td>• distracting sound effects;</td>
</tr>
<tr>
<td></td>
<td>• raised screens;</td>
</tr>
<tr>
<td></td>
<td>• attached cords;</td>
</tr>
<tr>
<td></td>
<td>• electronic devices that have calculators, such as Palm Pilots, cellular phones, BlackBerries®, iPods®, Bluetooth® technology devices, etc.</td>
</tr>
</tbody>
</table>

*Exception: The TI-Nspire calculator is allowed only when the TI-84 faceplate is on and in working mode. It is the responsibility of the test administrators to ensure that all calculators used on the Algebra I Subject Area Test are allowable. Use of a TI-Nspire calculator without the TI-84 faceplate is considered a testing irregularity and will result in the student’s score being invalidated.
Curriculum Framework

The Algebra I Subject Area Test is aligned with the 2007 Mississippi Mathematics Framework, Revised for Algebra I. The following chart shows a direct relationship between the curriculum and the subject area test. This chart is useful as a tool to plan classroom instruction.

The competencies (reporting categories of the test) and objectives are listed below.

<table>
<thead>
<tr>
<th>Competency 1: Number and Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Understand relationships between numbers and their properties and perform operations fluently.</strong></td>
</tr>
<tr>
<td>1a. Apply properties of real numbers to simplify algebraic expressions, including polynomials. (DOK 1)</td>
</tr>
<tr>
<td>1b. Use matrices to solve mathematical situations and contextual problems. (DOK 2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Competency 2: Algebra</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2. Understand, represent, and analyze patterns, relations, and functions.</strong></td>
</tr>
<tr>
<td>2a. Solve, check, and graph multi-step linear equations and inequalities in one variable, including rational coefficients in mathematical and real-world situations. (DOK 2)</td>
</tr>
<tr>
<td>2b. Solve and graph absolute value equations and inequalities in one variable. (DOK 2)</td>
</tr>
<tr>
<td>2c. Analyze the relationship between x and y values, determine whether a relation is a function, and identify domain and range. (DOK 2)</td>
</tr>
<tr>
<td>2d. Explain and illustrate how a change in one variable may result in a change in another variable and apply to the relationships between independent and dependent variables. (DOK 2)</td>
</tr>
<tr>
<td>2e. Graph and analyze linear functions. (DOK 2)</td>
</tr>
<tr>
<td>2f. Use algebraic and graphical methods to solve systems of linear equations and inequalities in mathematical and real-world situations. (DOK 2)</td>
</tr>
<tr>
<td>2g. Add, subtract, multiply, and divide polynomial expressions. (DOK 1)</td>
</tr>
<tr>
<td>2h. Factor polynomials by using Greatest Common Factor (GCF) and factor quadratics that have only rational roots. (DOK 1)</td>
</tr>
<tr>
<td>2i. Determine the solutions to quadratic equations by using graphing, tables, completing the square, the Quadratic formula, and factoring. (DOK 1)</td>
</tr>
<tr>
<td>2j. Justify why some polynomials are prime over the rational number system. (DOK 2)</td>
</tr>
<tr>
<td>2k. Graph and analyze absolute value and quadratic functions. (DOK 2)</td>
</tr>
<tr>
<td>2l. Write, graph, and analyze inequalities in two variables. (DOK 2)</td>
</tr>
</tbody>
</table>
Competency 3: Geometry

3. Understand how algebra and geometric representations interconnect and build on one another.
   3a. Apply the concept of slope to determine if lines in a plane are parallel or perpendicular. (DOK 2)
   3b. Solve problems that involve interpreting slope as a rate of change. (DOK 2)

Competency 4: Measurement

4. Demonstrate and apply various formulas in problem-solving situations.
   4a. Solve real-world problems involving formulas for perimeter, area, distance, and rate. (DOK 2)
   4b. Explain and apply the appropriate formula to determine length, midpoint, and slope of a segment in a coordinate plane. (i.e., distance formula, Pythagorean Theorem). (DOK 2)
   4c. Represent polynomial operations with area models. (DOK 2)

Competency 5: Data Analysis and Probability

5. Represent, analyze and make inferences based on data with and without the use of technology.
   5a. Draw conclusions and make predictions from scatter plots. (DOK 3)
   5b. Use linear regression to find the line-of-best-fit from a given set of data. (DOK 3)
Test Specifications

Test specifications are the guidelines used by the Mississippi Department of Education, test developers, and members of the Algebra I Teacher Committee in developing the Algebra I Test. The test specifications were drafted and finalized based upon the following information:

- General Considerations—considerations used in developing each subject area test
- Item Format—description of criteria for the development of the multiple-choice test items
- Test Format—general information on how the test is presented

General Considerations

- Items will be written to measure the competencies of the 2007 Mississippi Mathematics Framework, Revised.
- Items will be appropriate in terms of difficulty, interest, reading level (8th grade), and experience.
- Items included in the assessment will be reviewed specifically for the purpose of eliminating stereotyping and bias related to age, sex, ethnicity, creed, economic status, geographic location, disability, etc.
- Test items will be machine-scorable multiple-choice (MC) questions.
- When possible and appropriate, items will be presented in a real-world context or will show relationships to real-world situations. The term real-world is defined as “typical of an average person’s actual life experiences.” Students will be expected to demonstrate a refined ability to analyze, synthesize, and correlate information to determine the correct response to such test questions.
- Information will be presented through written text or through visual materials such as graphs, tables, maps, models, or other illustrations.
- Items may require students to apply previously acquired knowledge. Other items will provide information the student can use to answer the item.
- Some items may require mathematical computations.
- Decimal numbers less than 1 will be written with leading zeros.

Item Format

- Options such as “none of the above,” “both A and B,” and “all of the above” will NOT be used as answer choices.
- The item stem and answer choices should be on the same page with answer choices arranged beneath the item stem. Items with art in the answer choices may have the answer choices stacked beneath the item stem.
- Item stems will be in the form of a question.
- Numerical answer choices will be arranged in ascending or descending order. Answer choices will be expressed as letters and arranged in alphabetical order. In no case will a letter answer choice coincide with its answer option.

Test Format

- The test will be printed in black ink on white paper.
- Scenarios, graphic displays, corresponding items, and answer choices will appear on the same or facing pages.
- Negatives and superlatives used in item stems will be typed in capital letters and boldfaced (e.g. NOT, LEAST, BEST, and EXCEPT).
- The test will consist of 53 scorable and 12 experimental multiple-choice items.
Test Blueprint

A test blueprint identifies the reporting categories, or competencies, of a test and the number of items assigned to each competency. Test items are developed according to the blueprint, and students’ scores are derived from these items. The Algebra I Test blueprint is based on the competencies in the 2007 Mississippi Mathematics Framework, Revised for the Algebra I course.

The blueprint shows the specified number of items for each competency on the Algebra I Subject Area Test. This blueprint serves as a guide for test developers to write test questions and construct test forms. It will be used throughout the life of the testing program to design the test forms for each administration.

### Blueprint Summary Table

<table>
<thead>
<tr>
<th>Competency</th>
<th>Number of Scored Multiple-Choice Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number and Operations</td>
<td>7</td>
</tr>
<tr>
<td>Algebra</td>
<td>24</td>
</tr>
<tr>
<td>Geometry</td>
<td>7</td>
</tr>
<tr>
<td>Measurement</td>
<td>8</td>
</tr>
<tr>
<td>Data Analysis and Probability</td>
<td>7</td>
</tr>
</tbody>
</table>

| Total Number of Core (Scorable) Multiple-Choice Items | 53 *  |
| Total Number of Field-Test (Experimental) Multiple-Choice Items | 12 ** |
| Total Number of Test Items         | 65    |

* A student’s score will be based only on the 53 scored items.

** The remaining 12 items are field-test items embedded throughout the test. The number of field-test items may vary across all competencies.
Depth of Knowledge

Depth of Knowledge (DOK) is a measure of the cognitive demand of the task students are being asked to perform. Each objective listed for a competency has been assigned a DOK level. There are many factors/dimensions that contribute to DOK. These include the following:

- the level of conceptualization required of students;
- the type and level of generalization students must reach;
- the amount of prerequisite knowledge and contexts students need to synthesize from to complete the task;
- the level and complexity of reasoning required;
- the types and variety of representations (written, verbal, pictorial, symbolic, etc.) required to complete a response;
- the number and strength of connections students must make between facts, procedures, mental networks, concepts, and ideas;
- the required degree of generalization and transfer of knowledge and experience into new and/or different situations; and
- the grade level to which the item is assigned.

Below is a brief, general description of each level.

**Level 1: Recall** — Asks students to recall a fact, information, or a procedure

**Level 2: Basic Reasoning** — Asks students to use information or conceptual knowledge, often requiring two or more steps*

**Level 3: Complex Reasoning** — Asks students to use complex thinking and consideration of more than one possible approach and answer

**Level 4: Extended Reasoning** — Asks students to use strategic thinking to consider, plan, analyze, etc., usually resulting in a finished product

* While these guidelines are helpful, they should not be used as strict rules. For example, some “two-step processes/procedures” are, in fact, only DOK 1 if the multiple steps are just rote, defined, etc.; therefore, not every two-step process is automatically a DOK 2. For more comprehensive information about DOK, please visit the Office of Student Assessment website at http://www.mde.k12.ms.us/osa.
Performance Level Descriptors

Performance Levels and Score Reports

The Student Report* for the Mississippi Subject Area Tests provides information regarding how well a student has demonstrated mastery of the skills and content outlined in the Mississippi Curriculum Frameworks. In addition to numerical scores, the report will specify the student’s performance level, which is based on the student’s scale score. Those levels are as follows: advanced, proficient, basic, and minimal. The range for each level is determined by the standard setting for each subject area.

*A sample copy of a new Algebra I Student Report showing this information is on page 29 of this guide.

Purpose of Performance Level Descriptors

The performance level descriptors (PLDs) serve a dual purpose:

1. to guide the development of the assessments, help establish cut scores during standard setting, and act as descriptors, as well as
2. to guide teachers’ instructional efforts to ensure that students reach the proficient level of performance on the content standards.

The No Child Left Behind (NCLB) Act requires that PLDs for at least three levels, including basic, proficient, and advanced, will be set forth. The PLD for proficient must reflect the intended cognitive processes at the appropriate grade level as set forth in the standards. The total description for the PLDs must reflect the full range of the content standards in terms of the cognitive challenge, cognitive complexity, and cognitive depth indicated by the DOK level.

Content-Specific Performance Level Descriptors

At a specific performance level, the student must demonstrate the performance described at that level. The student may be able to do more, but until the student is able to demonstrate mastery of what is described in the next-higher level of performance, the student is assigned the lower level. The following page shows the content-specific performance level descriptors for Algebra I.
### Algebra I Mathematics Performance Level Descriptors

<table>
<thead>
<tr>
<th>Level</th>
<th>Students performing at the level:</th>
</tr>
</thead>
</table>
| **Advanced** | In **Number and Operations**: Justify solutions to mathematical situations involving matrices.  
**In Algebra**: Evaluate algebraic and graphical methods used to solve systems of linear equations and inequalities.  
**In Geometry**: Justify solutions of problems that involve interpreting slope as a rate of change.  
**In Measurement**: Justify the representation of polynomial operations with area models.  
**In Data Analysis and Probability**: Justify conclusions and predictions made from scatter plots. |
| **Proficient** | In **Number and Operations**: Use matrices to solve mathematical situations and contextual problems.  
**In Algebra**: Solve and graph multi-step linear equations and inequalities in one variable. Solve and graph absolute value equations and inequalities in one variable. Analyze the relationship between x and y values, determine whether a relation is a function, and identify domain and range. Explain and illustrate how a change in one variable may result in a change in another variable and apply to the relationships between independent and dependent variables. Graph and analyze linear functions. Use algebraic and graphical methods to solve systems of linear equations and inequalities in mathematical and real-world situations. Multiply and divide polynomial expressions. Factor polynomials by using Greatest Common Factor (GCF) and factor quadratics that have only rational roots. Justify why some polynomials are prime over the rational number system. Graph and analyze absolute value and quadratic functions. Analyze inequalities in two variables.  
**In Geometry**: Apply the concept of slope to determine if lines in a plane are parallel or perpendicular. Solve problems that involve interpreting slope as a rate of change.  
**In Measurement**: Explain and apply the appropriate formula to determine length, midpoint, and slope of a segment in a coordinate plane. Represent polynomial operations with area models.  
**In Data Analysis and Probability**: Use linear regression to determine the line-of-best-fit from a given set of data. Draw conclusions and make predictions from scatter plots. |
| **Basic** | In **Number and Operations**: Apply properties of real numbers to simplify algebraic expressions.  
**In Algebra**: Check multi-step linear inequalities in one variable. Write and graph inequalities in two variables. Add and subtract polynomial expressions. Determine the solutions to quadratic equations.  
**In Measurement**: Solve real world problems involving formulas for perimeter, area, distance and rate. |
| **Minimal** | Students performing at the minimal level inconsistently demonstrate the knowledge or skills that define basic level performance. |
The Formula Chart

Perimeter
- square: $P = 4s$
- rectangle: $P = 2(l + w)$

Circumference
- circle: $C = 2\pi r$

Area
- square: $A = s^2$
- rectangle: $A = lw$ or $A = bh$
- triangle: $A = \frac{1}{2}bh$
- trapezoid: $A = \frac{1}{2}(b_1 + b_2)h$
- circle: $A = \pi r^2$

Surface Area
- cube: $S = 6s^2$
- cylinder (lateral): $S = 2\pi rh$

Volume
- rectangular prism: $V = lwh$
- cylinder: $V = \pi r^2h$
- cube: $V = s^3$

Pythagorean Theorem
- right triangle: $a^2 + b^2 = c^2$

Midpoint Formula
- $M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

Slope of a Line
- $m = \frac{y_2 - y_1}{x_2 - x_1}$

Quadratic Formula
- $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Slope-Intercept Form of an Equation
- $y = mx + b$

Point-Slope Form of an Equation
- $y - y_1 = m(x - x_1)$

Standard Form of an Equation
- $Ax + By = C$

Distance Formula (between two points on a coordinate plane)
- $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- $d = rt$

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Samples of Algebra I Test Items

* indicates correct answer

Competency 1: Number and Operations
Objective 1a: Apply properties of real numbers to simplify algebraic expressions, including polynomials.

Depth of Knowledge Level: 1
Performance Level: Basic

Sample Item #1

Which is equivalent to the expression below?

\[6y + 2(4x + 7y) - 8x\]

A \(-4x + 15y\)
B \(16x + 13y\)
C \(13y\)
D \(20y *\)

Competency 1: Number and Operations
Objective 1b: Use matrices to solve mathematical situations and contextual problems.

Depth of Knowledge Level: 2
Performance Level: Proficient

Sample Item #2

What values of \(w, x, y,\) and \(z\) make this matrix equation true?

\[
\begin{bmatrix}
4 & 3 \\
-2 & 7
\end{bmatrix}
+ \begin{bmatrix}
w & x \\
y & z
\end{bmatrix}
= \begin{bmatrix}
5 & -2 \\
7 & 3
\end{bmatrix}
\]

A \(w = 1, x = -5, y = 9, z = 4\)
B \(w = 1, x = -5, y = 9, z = -4 *\)
C \(w = 1, x = -1, y = 9, z = -4\)
D \(w = 1, x = -5, y = 5, z = -4\)
Competency 1: Number and Operations
Objective 1b: Use matrices to solve mathematical situations and contextual problems.

Depth of Knowledge Level: 2  Performance Level: Proficient

Sample Item #3

Matrix $A$ is shown below.

$A = \begin{bmatrix} 3 & 2 & 0 \\ 4 & -3 & 1 \end{bmatrix}$

What is $-2A$?

A $\begin{bmatrix} -5 & 0 & -2 \\ 2 & -5 & -1 \end{bmatrix}$

B $\begin{bmatrix} -6 & -4 & 0 \\ -8 & 6 & -2 \end{bmatrix}$ *

C $\begin{bmatrix} -6 & 4 & 0 \\ 8 & -6 & 2 \end{bmatrix}$

D $\begin{bmatrix} -1 & 4 & 2 \\ 6 & -1 & 3 \end{bmatrix}$

Competency 2: Algebra
Objective 2a: Solve, check, and graph multi-step linear equations and inequalities in one variable, including rational coefficients in mathematical and real-world situations.

Depth of Knowledge Level: 2  Performance Level: Proficient

Sample Item #4

The cost of renting the party room at a local restaurant is $120 plus $32 per hour. Beth had a graduation party and her mother got a bill for $264. How long did Beth use the room?

A 1.9 hours

B 2 hours

C 2.5 hours *

D 4.5 hours *
Competency 2: Algebra
Objective 2a: Solve, check, and graph multi-step linear equations and inequalities in one variable, including rational coefficients in mathematical and real-world situations.

Depth of Knowledge Level: 2  
Performance Level: Proficient

Sample Item #5

What is the solution set for this inequality?

\[ 4x - 2 \geq 9x - 20 + x \]

A \( \{ x : x \leq \frac{18}{5} \} \)  
B \( \{ x : x \geq -3 \} \)  
C \( \{ x : x \leq 3 \} \)*  
D \( \{ x : x \geq -\frac{11}{5} \} \)

Competency 2: Algebra
Objective 2b: Solve and graph absolute value equations and equalities in one variable.

Depth of Knowledge Level: 2  
Performance Level: Proficient

Sample Item #6

What is the product of the solutions to the equation?

\[ |2x - 1| = 3 \]

A \(-4\)  
B \(-2 \)
C \(2 \)*  
D \(4\)
Competency 2: Algebra
Objective 2c: Analyze the relationship between \( x \) and \( y \) values, determine whether a relation is a function, and identify domain and range.

Depth of Knowledge Level: 2
Performance Level: Proficient

Sample Item #7

The following is the graph of the equation \( y = x^2 \), in which \( y \) is a function of \( x \).

Which of these describes the range of the function?

A. \( x \) is all real numbers
B. \( y \) is all real numbers
C. \( y \geq 0 \)
D. \( x \geq 0 \)
Competency 2: Algebra
Objective 2e: Graph and analyze linear functions.

Depth of Knowledge Level: 2
Performance Level: Proficient

Sample Item #8

The following set of ordered pairs, \((n, p)\), represents \(p\), the monthly profit of a store for four different months based on \(n\) items sold each month.

\[
\{(1000, 4000), (2000, 10,000), (3000, 16,000), (4000, 22,000)\}
\]

Which of these could represent the relationship between \(n\) and \(p\) in the ordered pairs of the set?

A \( p = 6n - 2000 \)
B \( p = n + 3000 \)
C \( p = 3n + 1000 \)
D \( p = 5000 - 6n \)

Competency 2: Algebra
Objective 2g: Add, subtract, multiply, and divide polynomial expressions.

Depth of Knowledge Level: 1
Performance Level: Basic

Sample Item #9

What is the sum of the polynomials \((2x^2 - 3x + 5)\) and \((-x^2 + 6x - 8)\)?

A \( x^2 - 3x + 3 \)
B \( x^4 + 3x^2 - 3 \)
C \( 3x^2 + 3x - 3 \)
D \( x^2 + 3x - 3 \)
Competency 2: Algebra
Objective 2h: Factor polynomials by using Greatest Common Factor (GCF) and factor quadratics that have only rational roots.

Depth of Knowledge Level: 1 Performance Level: Proficient

Sample Item #10

Which shows the following polynomial factored completely?

\[9b^3 + 24b^2 + 16b\]

A \[b(3b - 4)^2\]  
B \[3b(3b^2 + 8b)\]  
C \[3b^2(3b + 8)\]  
D \[b(3b + 4)^2\]

Competency 2: Algebra
Objective 2k: Graph and analyze absolute value and quadratic functions.

Depth of Knowledge Level: 2 Performance Level: Proficient

Sample Item #11

What is the sum of the solutions to the quadratic equation?

\[x^2 - 4x - 5 = 0\]

A 0  
B 4 *  
C 5  
D 6
Competency 2: Algebra
Objective 2l: Write, graph, and analyze inequalities in two variables.

Depth of Knowledge Level: 2
Performance Level: Proficient

Sample Item #12

Susan’s cell phone plan has a fixed fee of $35 plus $0.10 per text message. She must spend less than $50 on her phone service this month. What is the maximum number of text messages that she can send or receive to stay within her budget?

A  149 *
B  150
C  499
D  500
Competency 3:  Geometry
Objective 3a:  Apply the concept of slope to determine if lines in a plane are parallel or perpendicular.

Depth of Knowledge Level: 2  Performance Level: Proficient

Sample Item #13

The graph of \( y = -3x - 1 \) is shown below.

Which of the following equations represents the line perpendicular to \( y = -3x - 1 \) and passing through the point \((4, 3)\)?

A  \( y = -3x + 15 \)

B  \( y = \frac{1}{3}x + \frac{5}{3} \)

C  \( y = 3x - 9 \)

D  \( y = \frac{1}{3}x + \frac{5}{3} \)  *
Competency 3: Geometry
Objective 3b: Solve problems that involve interpreting slope as a rate of change.

Depth of Knowledge Level: 2  
Performance Level: Proficient

Sample Item #14

Between which time interval is the rate of change the greatest?

A  $0 < t \leq 1$
B  $1 < t \leq 2$ *
C  $2 < t \leq 3$
D  $3 < t \leq 4$
Competency 4: Measurement
Objective 4a: Solve real-world problems involving formulas for perimeter, area, distance, and rate.

Depth of Knowledge Level: 2
Performance Level: Basic

Sample Item #15

Brenita has a rectangular garden that is 12 feet wide and has a diagonal of 20 feet. She wants to put a border around the perimeter of the garden. How many feet of border will she need?

A 32
B 56 *
C 64
D 76
### Competency 5: Data Analysis and Probability
Objective 5a: Draw conclusions and make predictions from scatter plots.

#### Depth of Knowledge Level: 3  
Performance Level: Proficient

**Sample Item #16**

Mrs. Johnson asked her students to list the number of minutes they spent studying and the scores they made on their Algebra test. She then told them to create a scatter plot with the data they collected. Based on the information below, approximately how many minutes should they have studied if they wanted to score 100 on her test?

<table>
<thead>
<tr>
<th>Time Spent Studying</th>
<th>15</th>
<th>12</th>
<th>20</th>
<th>30</th>
<th>25</th>
<th>40</th>
<th>60</th>
<th>50</th>
<th>55</th>
<th>45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score on Test</td>
<td>65</td>
<td>68</td>
<td>75</td>
<td>80</td>
<td>79</td>
<td>85</td>
<td>97</td>
<td>80</td>
<td>88</td>
<td>73</td>
</tr>
</tbody>
</table>

A  50 minutes  
B  60 minutes  
C  70 minutes  
D  80 minutes *
Interpretation of Score Reports for Algebra I

Several different score reports are available following administrations of the Mississippi Subject Area Tests:

- The Student Report gives the scores for an individual student.
- The Class Performance Report gives the scores for all students in a particular class.
- The School Summary Report by Competency displays the total performance of an entire school.
- The Student Roster & Summary gives a summary of each student’s performance in a school.
- The School Summary Report Combined Standard Administrations gives a summary of all the scores for students in a school who participated for the first time in the fall and spring administrations.

Because the most immediate interest for a classroom teacher is the performance of his or her own students, the following discussion explains how to interpret the information contained in the Class Performance Report and the Student Report. A sample Class Performance Report and a sample Student Report appear on pages 27 and 29, respectively.

Score Report Information

Beginning in 2007–2008, all students enrolled in Algebra I for the first time were tested on material from the 2007 Mississippi Mathematics Framework, Revised. Sample reports for the 2007 Mississippi Mathematics Framework, Revised are included in this guide.

Students who were enrolled in Algebra I prior to the 2007–2008 school year were taught from the Mississippi Mathematics Framework 2000. Any of these students who did not obtain a passing score will continue to be assessed based on the Mississippi Mathematics Framework 2000. These students will receive reports that differ slightly from the reports featured in this guide. To obtain more information about the Class Performance Report and the Student Report for students who were taught from the Mississippi Mathematics Framework 2000, please access the Office of Student Assessment website at http://www.mde.k12.ms.us/osa.
**Class Performance Report**

The *Class Performance Report* shows the scores for each student within a classroom who will take the Algebra I test during the 2011–2012 school year. Two copies are provided for each school.

- The top portion of the report displays the teacher’s name, administration name, school name, district name, and district and school code.

- The top-left portion of the report labeled SUMMARY shows the following information for included students: the TOTAL N-COUNT (the number of students within the classroom who took the test), the number of students included in the SUMMARY, the mean scale score, the number of students who passed, and the percentage of students who passed.

- Below the SUMMARY information is an alphabetical list of the students in the class who took the Algebra I test. Each student’s MSIS identification number, as recorded on the student’s answer sheet at the time of testing, is also displayed.

The data portion of the *Class Performance Report* includes the SCALE SCORE, Summary Exclusion Flag, the PASS/FAIL STATUS, and the raw scores for MULTIPLE-CHOICE ITEMS.

- The SCALE SCORE is each student’s total test score. Each student’s raw score is converted to a scale score. A raw score is the number of points earned for a domain or competency. Scale scores represent approximately equal units on a continuous scale of numbers that will typically range from 620 to 680. The raw scores from different forms may not be comparable because forms can vary in difficulty. Because the raw scores may not be comparable across forms, they are converted to scale scores through a statistical process that adjusts for any differences in test difficulty between forms. For this reason, the scale scores are especially suitable for comparing student performance across years and for ensuring that the same level of difficulty of a performance standard is maintained across years.

- The Summary Exclusion Flag indicates if the student’s score is not included in the SUMMARY. Explanations of the status codes assigned to students who are not included in the SUMMARY are shown at the bottom of the report in the Legend section.

- Next to the Summary Exclusion Flags is a column indicating PASS/FAIL STATUS. This status indicates the comparison of the student’s scale score to the passing score (647) for the test. If a student’s scale score is equal to or greater than the passing score, this column indicates PASS. If the student’s scale score is less than the passing score, this column indicates FAIL.

- The columns beneath the MULTIPLE-CHOICE ITEMS heading provide information on the tested competencies from the 2007 *Mississippi Mathematics Framework, Revised*. The top of the first column shows the Total Raw Score (the maximum number of points possible). Points are based on the number of correct answers. Each student’s Total Raw score is displayed in this column. If the student did not obtain a score, then a status code is displayed and explained by the legend at the bottom of the report. The tops of the remaining columns show the five competencies (Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability) being tested and the maximum number of points possible for each competency. Raw scores within each competency for each student are displayed in these columns.

- At the bottom of the table, the MEAN RAW SCORE and AVERAGE PERCENT CORRECT values are listed by competency. The MEAN RAW SCORE and AVERAGE PERCENT CORRECT values are calculated only for first-time test takers who are included in the SUMMARY. The MEAN RAW SCORE is the raw score of the students included in the SUMMARY. The AVERAGE PERCENT CORRECT is the mean raw score per competency divided by the maximum number of points possible for that competency.
### Sample Algebra I Class Performance Report

#### SUMMARY:
- **Total N-Count:** ####
- **Mean Scale Score:** ###.
- **Number Included:** ####
- **Mean Scale Score:** ###.
- **Number Passing:** ####
- **Percent Passing:** ###.

#### ALGEBRA I Competency

<table>
<thead>
<tr>
<th>Competency</th>
<th>Total Number Correct</th>
<th>Number and Operations</th>
<th>Algebra</th>
<th>Geometry</th>
<th>Measurement</th>
<th>Data Analysis and Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>53</td>
<td>7</td>
<td>24</td>
<td>7</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

#### STUDENT NAME

<table>
<thead>
<tr>
<th>LASTNAME</th>
<th>FIRSTNAME</th>
<th>MISS ID</th>
<th>SCALE</th>
<th>PASS/FAIL</th>
<th>PASS/FAIL STATUS</th>
<th>Number Correct</th>
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</tr>
</tbody>
</table>

#### AVERAGE NUMBER CORRECT

###.

#### AVERAGE PERCENT CORRECT

###.

#### SUMMARY:
- **Total N-Count:** ####
- **Number Included:** ####
- **Mean Scale Score:** ###.
- **Number Passing:** ####
- **Percent Passing:** ###.

Legend:
- E = Excluded from Summary
- R = Retest, Excluded from Summary
- INV = Invalid Test
- DNA = Did Not Attempt
- COND = Pass status is pending official confirmation

- Copy: 01
- Page X of Y
- Zbatch or Process No.
Student Report

The Student Report (two copies per student) provides the scores for each student who takes the Algebra I Subject Area Test.

- The top-center portion of the Student Report displays the student’s name, MSIS identification number, and date of birth as recorded on the student’s answer sheet at the time of testing.

- The top-right portion of the Student Report contains the administration name, Class Name, School Name, District Name, and district and school Code.

The top table of the Student Report includes the subject area Passing Score, the student’s Pass/Fail Status, Scale Score, Performance Level, and a comparison of the student’s score to other students testing for the first time within his or her school, district, and state. The bottom table of the Student Report includes the student’s performance by competency.

TOP TABLE

- The Passing Score is the scale score required to pass the test. The passing score was determined by a committee of educators from Mississippi who recommended a total test raw score to indicate passing. This total test raw score is converted to a scale score, which is displayed as the passing score.

- The Pass/Fail Status represents the comparison of the student’s scale score to the passing score. If the student’s scale score is equal to or greater than the passing score (647), the status is PASS. If the student’s scale score is less than the passing score, the status is FAIL.

- The Scale Score represents the student’s total test score. The raw score on the total test is converted to a scale score. The scores are scaled so that the range of proficient scores starts at 650 and the distribution of scores has a standard deviation of 10. This means that most scores will fall within the range of 620–680. The actual maximum and minimum scale scores will vary from year to year as new forms are administered. The passing score for Algebra I is 647. A scale score is given only if the student attains a valid raw score. If a valid score is not attained, then one of the status codes is printed instead of the scale score.

- A Performance Level is indicated and explained in the right column, unless the student receives a status code of DNA, INV, DNF, 04, or 05. The four performance levels are advanced, proficient, basic, and minimal. The scale score range for each performance level is described in the table below.

- The comparison begins with Your Score followed by the School average, District average, and State average for first-time test takers. (For students who participate in the September or April SENIORS only retests, the comparison of Your Score is made to only the State average from the previous spring administration. No sample provided.)

BOTTOM TABLE

- The bottom table provides information for the tested assessment strands or competencies from the Mississippi Curriculum Framework. To the right of this information is the maximum number of points possible, the number of points correct (raw score), and the percentage of correct answers the student achieved for each assessment strand or competency.

New Mississippi Student Performance Levels

<table>
<thead>
<tr>
<th>Subject</th>
<th>Label</th>
<th>Scale Score Values*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algebra I</td>
<td>Advanced</td>
<td>661 and above</td>
</tr>
<tr>
<td></td>
<td>Proficient</td>
<td>650–660</td>
</tr>
<tr>
<td></td>
<td>Basic</td>
<td>642–649</td>
</tr>
<tr>
<td></td>
<td>Minimal</td>
<td>641 and below</td>
</tr>
</tbody>
</table>
On another day or with another set of test questions, the student might obtain a slightly different score. For about two out of every three such testing opportunities, a student’s score would fall within a range of scores very similar to the reported scale score. The range of possible scores is the scale score plus or minus the Conditional Standard Error of Measurement (CSEM), an index of measurement precision. The CSEM does not mean there was any “mistake” in measurement, just that there is some imprecision in any measurement. For example, if you weigh yourself, you will have a different weight in the morning than in the evening, or your home scale will give a different weight than the scale at the doctor’s office or the one at the gym. Overall, those different measurements all give a good idea of your true weight, but your true weight might be some other value altogether. If the SEM were 2 and a student’s score 100, then one could say that the range of likely scores is 100+/-2 or that there is a 68% probability that the student’s true score is between 98 and 102. For the Mississippi Subject Area Tests in Algebra I and English II, the CSEMs are about 3 points in the middle of the distribution, where the cut scores for Proficient and Passing are set. As you move to the extremes of the score distribution, the CSEM increases because there are fewer test questions that are very hard or very easy, and there are also fewer students that answer all or no test questions correctly. Overall, the CSEMs on the SATP range from 3 in the middle of the distribution to 7 at the tails.
Glossary of Test Terms

**Blueprint**: The blueprint indicates the number of items from each competency that must appear on a test.

**Competencies**: Objectives used for test-construction purposes are combined for reporting purposes into competencies. The test items are written to the objectives, not to the competencies.

**Core items**: This term refers to the scorable test items that count toward the student’s score.

**Criterion-referenced test (CRT)**: CRTs are constructed to assess a student’s understanding of given competencies or objectives. The Mississippi Subject Area Tests are criterion-referenced tests.

**Depth of Knowledge (DOK)**: DOK measures the cognitive demand of the task students are being asked to perform.

**Distractors**: This term refers to the incorrect choices to a multiple-choice item.

**Enhanced multiple-choice items**: This term refers to test items that ask the student to use graphic information or to use information provided about the world outside of the school setting.

**Equating**: This term refers to the process that uses linking items to construct different forms of a test so that each form has the same degree of difficulty.

**Field-test items**: Field-test items have never been on a test before. These items have no statistical data and are not counted for or against the student’s score. Once these items have been tested and statistically evaluated, they may appear on new forms of the test or they may be deleted. Because field-test items are not identified on the test, students will not know which items count and which do not.

**Forms**: Different test forms are used at each administration. All forms are constructed so that they have the same number of items in each of the competencies. In addition, they have the same statistical qualities; that is, they have the same degree of difficulty.

**Item**: This term refers to a single question or problem in a test.

**Lead art**: This term refers to the graphic portion of the item that precedes the written portion of the item. Lead art is different from the art that may be used as options.

**Linking items**: This term refers to items that are found across more than one test form. They are used for equating forms and must be identical on all test forms.

**Multiple-choice items**: This term refers to items that ask students to choose the correct answer from several given answers or options.

**Objective**: This term refers to the knowledge, skill, process, or strategy that an item measures.

**Objective/item match**: There must be alignment between a given objective and an item that measures the objective. During item review, each item must match the objective or the item will be moved to the appropriate objective.

**Options**: This term refers to the possible responses in multiple-choice items, including the correct response and all distractors. Some options will appear as art.

**Selected-response item**: This is another term for a multiple-choice item.

**Standardized test**: This term refers to a test that contains the same content administered in the same way for everyone taking the test.

**Stem**: The item stem states the problem and is posed as a question or as an incomplete statement.

**Stimulus**: The item stem, piece of art, or referent that prompts a response is called a stimulus.

**Test construction**: This term refers to the selection of the items that go into each form of a test and to the arrangement of the items in an appropriate sequence.