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ABSTRACT

This document is a supplement to the Test Content Description for the Georgia High School Test in Mathematics. The sample items are representative of items on the actual Georgia High School Tests. The strands (major areas) being tested are: (1) Number and Composition (17% to 19% of the test); (2) Data Analysis (19-21% of the test); (3) Measurement and Geometry (32% to 34% of the test); and (4) Algebra (28% to 30% of the test). General test taking hints are given, suggesting that students read carefully, consider every choice, guess intelligently, spend test time wisely, and check work carefully. Some sample items with explanations of the answers are given, and other practice items are included with answers but no explanations. A student self-assessment and remediation plan is attached. (SLD)

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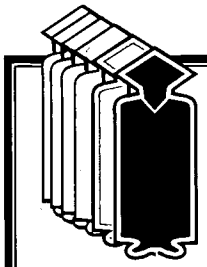
How to Prepare for Tests



A Guide for Georgia High School Students Preparing for the Georgia High School Graduation Tests

Content: Mathematics

Including:

Hints on Preparing for the GHSGTs
Practice Test Questions and Answers
Thorough Explanation of the Answers to Select Questions

NOTE: This section is intended as a student aid and is *not* copyrighted. Please photocopy as necessary for student use.

October 1999

Table of Contents

Introduction

This document is designed as a supplement to the *Test Content Description* for Mathematics. The strands and their respective weights are included here. However, please refer to the *Test Content Description* (available from your teacher) for further description of the tested objectives.

The sample items listed in this document are representative of the items found on the actual Georgia High School Tests. The strands (or major areas relating to mathematics) being tested are:

Number and Computation (17-19% of the test)

Items test uses and properties of numbers, operations, computing with integers, decimals, fractions, percents, and proportions. Real-world applications include various aspects of using money as well as estimation and problem solving (which operation to use).

Data Analysis (19-21% of the test)

Items test use of exact and approximate numbers, probability, and reading and interpreting graphs, charts, and tables. Statistical measures such as mean, median, mode, and range are also assessed.

Measurement and Geometry (32-34% of the test)

Items test estimation and determination of length, area, volume, weight, time, and temperature. Similar and congruent figures, use of proportions to find missing sides of figures, and use of scale drawings are also assessed. The coordinate plane is tested, as well as geometric properties and figures, solving problems with angles, and use of the Pythagorean theorem.

Algebra (28-30% of the test)

Items test algebraic principles such as evaluating and simplifying algebraic expressions, solving equations, and ratios and proportions.

While test score reports provide scaled scores for each of these strands, it is performance on the overall test that is of primary importance. Strand scores are provided in order to give students, teachers, and parents/guardians an idea of student relative strengths and weaknesses. It is important to remember that while the overall difficulty of the tests remains the same from one edition to the next, difficulty for a particular strand may vary. Thus, some students who score below 500 on a given strand on one occasion may score above 500 on the same strand on a subsequent occasion. Over the course of several tests, a student may even score above 500 on all four strands without having passed the test.

Hints to Help You Pass the GHSGT

Read everything carefully.

Many of the GHSGT questions involve short articles, tables, charts, and graphs. All test questions require careful reading of the directions and the question and four answer choices.

There are no trick questions.

While it is important to read each question carefully, we have not included any trick questions. You should not spend too much time trying to figure out what we *really* mean. If you read the entire question (including all accompanying material), the real meaning should be clear. We do not consider requiring a careful reading of the entire question to be a trick.

Consider every choice.

You must choose, from the four alternatives, the answer that best addresses the question. Some of the alternatives (distractors) will be attractive because they include an irrelevant detail, a common misconception, or apply the right information in the wrong way.

Guess intelligently.

There is no penalty for guessing on this test. If you are not sure of the correct answer you are encouraged to guess. Guessing is easier if you can eliminate one or more distractors as clearly incorrect. Be warned, however, that many of the distractors are very attractive because they are based on common mistakes students make.

Spend test time wisely.

Many tests are arranged so that the easiest items are first and the hardest are last. The GHSGT are not arranged that way. Instead the questions are arranged by topic. Therefore, it is possible to find several difficult questions, followed by a set of easier questions later. If you run into a few hard questions, do not get discouraged. It would be better to move on, answer as many questions as possible, and then go back and re-attempt the harder questions.

Check your work.

There are several places where carelessness can cause you to answer incorrectly. The first is in the initial reading of the question. Read everything carefully. The second is in choosing the answer. You should evaluate each answer option critically to make sure it actually answers the question. The third possibility for making a mistake is in the transfer of the correct answer to your answer document. You should ask yourself two questions: "Am I on the right question number in the right section of the test?" and "Is this the answer I mean to mark?"

Practice Test Questions with Explanations of Answers

Explanation of parts of a test question

Lunch sales at Scoop and Judy's Hamburger Haven are shown below.

Day	Lunch Sales
Sunday	$108.65
Monday	$205.35
Tuesday	$190.10
Wednesday	$265.50
Thursday	$215.15
Friday	$225.25
Saturday	$225.25

Stimulus

Use the data in the chart to determine the median.

Stem

A. $156.85 <=Distractor
B. $205.04 <=Distractor
C. $215.15 <=Key
D. $225.25 <=Distractor

Options

Cognitive Levels

Cognitive levels are based on learning expectations, not item difficulty, although the higher level items generally prove to be more difficult.

Low: requires recognition only and typically deals with terminology, identification, or other low-level activities

Medium: requires some degree of interpretation of a problem or situation in which a scientific principle is applied

High: requires a significant degree of interpretation, problem solving, and analysis (e.g., devising a solution to a problem by applying a scientific principle)

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1. The number 4:37 **most likely** represents a

A. distance.
B. score.
C. time.
D. zip code.

Explanation:

Of the four options given, only one (C) typically contains a colon. Thus, the other three options (distractors) can be eliminated. This question has a **low** cognitive level (it is basic recall of information) and falls under the strand **Number and Computation**.

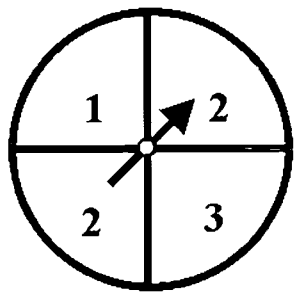
2. Which value is greatest?

A. 4^2
B. 5^2
C. 2^3
D. 3^3

Explanation:
In this problem, the student needs to compute each exponential number and then compare the results to determine which is greatest. A is 4×4, or 16. B is 5×5, or 25. C is $2 \times 2 \times 2$, or 8. D is $3 \times 3 \times 3$, or 27. Thus, D is the correct answer since 27 is larger than the other three computations.

This question has a **medium** cognitive level because it requires computing the exponential numbers, then comparing the answers to find which is greatest, but does not require significant interpretation of the stem to determine the answer. This question falls under the strand **Number and Computation**

3. Find the probability of spinning a "2" on the spinner below.



A. 0
B. $\frac{1}{4}$
C. $\frac{1}{2}$
D. 1

Explanation:
We can eliminate both A and D immediately, as A requires that the spinner would not land anywhere or that there is no "2" on the spinner, and D requires that the spinner fall on 2 all the time. Upon initial review, the obvious choice may appear to be (B), ¼, since there are four spaces on the spinner. However, closer scrutiny

reveals that two of the sections on the spinner have the same number (2). The spinner, then, has a 2 out of 4, or ½, chance of landing on 2. Thus, C is the correct answer. This question has a **medium** cognitive level because it requires some degree of interpretation beyond recall. It falls under the strand **Data Analysis**.

4. Choose the situation below where a result using approximate numbers would be expected.

A. the cost of two tickets to a West High baseball game
B. the number of buses bringing students to West High School each day
C. the number of people in attendance at a West High varsity football game
D. the number of points West High varsity basketball team scored in Tuesday night's game

Explanation:
Options A, B, and D all require precise numbers in order to gather the information these distractors call for. Only option C does not require a precise number—an approximation of the number of people in attendance at the game. An exact number is not needed here as with the other three distractors.

This question has a **low** cognitive level and falls under the strand **Data Analysis**.

5. The **best** estimate for the length of a boy's shoe is

A. 10 inches.
B. 10 feet.
C. 10 yards.
D. 10 miles.

Explanation:
The answer here must be 10 inches (A), as all the other measurements are extremely long for measuring a boy's foot. Some students may trip on option B since it mentions the word "feet."

This question has a **low** cognitive level as it requires recall of various lengths and when to use each one. The question falls under the strand **Measurement and Geometry**.

6. One gallon of paint will cover 800 square feet. How many gallons of paint are needed to cover a wall that is 8 feet high and 200 feet long?

A. $\frac{1}{4}$

B. 2

C. 4

D. 8

Explanation:
This question requires students to know how to determine the area of a rectangle. The area (length × width) of the wall in the question is 8 × 200, or 1600 feet. Dividing 1600 by 800 (the amount of paint one gallon will cover) yields the answer 2. Thus, B is the correct answer. The distractors are common mistakes made by students who do not know how to compute area. Option A is the reduction of 200 over 800. Option C is the result of 800 divided by 200. Option D comes from simply rewriting the 8 in the stem.

This question has a **high** cognitive level because it requires a student to know how to find the area of a rectangle and to know when finding the area will help solve a problem. This question falls under the strand **Measurement and Geometry**.

7. Evaluate $(a + b) - 3c$, when $a = 7$, $b = 8$, and $c = 0$.

A. 0
B. 5
C. 12
D. 15

The easiest means of solving this problem is to plug the values of the variables into the expression. The order of operations states that operations contained within parentheses should be completed first, followed by multiplication, and then subtraction. Our expression $(a + b) - 3c$ can be rewritten as $(7 + 8) - 3 \times 0$. Performing the operation in parentheses first, we get $7 + 8 = 15$. We next multiply 3×0 and get 0. Our reduced expression, then, is $15 - 0$, or 15. Thus, the correct answer is D. The distractors may be appealing to those students who do not know how to evaluate an algebraic expression. Some students may choose A because they know that 0 times anything equals 0. Some students may choose B if they add 7 + 8 and then divide by 3. Finally, some students may choose C if they first add 7 + 8, then subtract 3.

This question has a **high** cognitive level since it requires analysis of a given expression and the determination of the correct means of solving it. This question falls under the strand **Algebra**.

Additional Sample Questions

Following are additional sample questions that students may use to help prepare for the Georgia High School Graduation Test in Mathematics. These questions will NOT appear on the mathematics test, but are representative of the some of the types of questions you should expect on the test. The answers are on page twelve.

Strand 1: Number and Computation

1. Which value is closest to 0.67?

   A. $\frac{3}{9}$

   B. $\frac{13}{26}$

   C. $\frac{2}{3}$

   D. $\frac{6}{7}$

2. Compute the following.

   $(54 \times 10^{-3}) \div (9 \times 10^{-5})$

   A. 6.0×10^{-8}
   B. 60×10^{-8}
   C. 6.0×10^{2}
   D. 6.0×10^{3}

3. Maria's dental plan pays 88% of the expenses after the deductible of $150 is subtracted. Maria's total dental bill was $547. Which is the best estimate of the amount the insurance company will pay?

   A. $240
   B. $270
   C. $320
   D. $360

4. The equation
   $3(4x + 2) = (4x + 2)3$
   is true for all real numbers (x). Which property does this exemplify?

   A. associative property of addition
   B. associative property of multiplication
   C. commutative property of multiplication
   D. commutative property of addition

5. Charles wants to buy a chair for his room that is usually priced at $75.00 and is now discounted by 30%. What in the sale price of the chair?

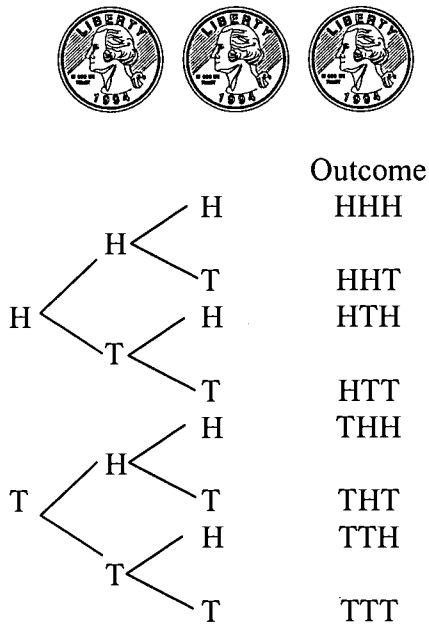
   A. $22.50
   B. $52.50
   C. $74.70
   D. $97.50

6. To estimate the cost of three items, which method is **most** appropriate?

   A. calculator
   B. computer
   C. mental arithmetic
   D. paper and pencil

Strand 2: Data Analysis

7. Use the tree diagram below to predict the probability of flipping 3 coins and getting all heads or all tails.



A. $\frac{1}{4}$

B. $\frac{1}{2}$

C. 1

D. 2

8. If the mean number of people who attended six basketball games is 7,380, what was the total attendance at the six games?

A. 1,230
B. 7,380
C. 22,140
D. 44,280

9. Use the table below to answer question 9.

State	Number of Cars
Mississippi	10
Alabama	7
Louisiana	50
Tennessee	4
Georgia	13

On her trip to Florida, Jane amused herself by counting license plates on cars. The table above summarizes her data. Which state was Jane **most likely** traveling through at the time of her survey?

A. Alabama
B. Georgia
C. Louisiana
D. Tennessee

10. Juan's monthly expense distribution is shown below.

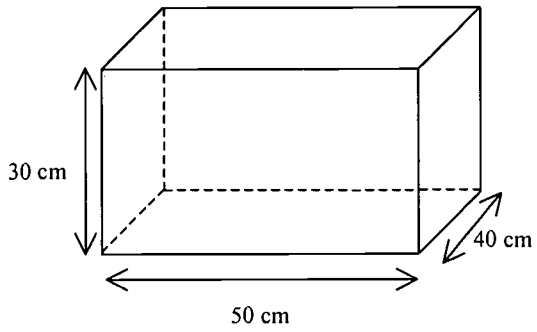
Taxes	28%
Rent	20%
Food	17%
Utilities	13%
Transportation	12%
Clothing	5%
Miscellaneous	5%

Which type of graph should be used to show each of Juan's expenses as a part of his total expenditures?

A. bar graph
B. circle graph
C. line graph
D. pictograph

Strand 3: Measurement and Geometry

11. The number of tropical fish that an aquarium can hold depends on the volume of the fish tank. The interior dimensions of the fish tank below are 50 cm, 40 cm, and 30 cm. Each fish requires 10,000 cubic centimeters of water. How many tropical fish will this fish tank hold? (Use $V = lwh$)



A. 5
B. 6
C. 50
D. 60,000

12. A rotating sprinkler is used to water a yard. The radius of the area being sprayed is 10 feet. What is the wet area of the yard?

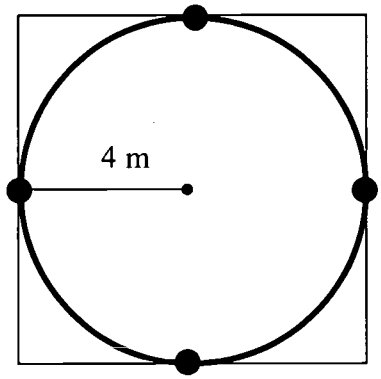
(Use $A = \pi r^2$ and $\pi = 3.14$)

A. 31.4 square feet
B. 301.4 square feet
C. 314 square feet
D. 3,140 square feet

13. On a map of Georgia, one inch is equivalent to 50 miles (1 inch = 50 miles). If the distance between two towns is $1\frac{3}{4}$ inches, what is the actual distance between the towns?

A. 8.75 miles
B. 50.75 miles
C. 65 miles
D. 87.5 miles

14. The square shown below has an area of $64m^2$. Find the area of the circle. (Use $A = s^2$, $A = \pi r^2$, and $\pi = 3.14$.)



A. $15.7m^2$
B. $25.12m^2$
C. $50.24m^2$
D. 100.48m

Strand 4: Algebra

15. Simplify the expression below, if possible. ($a \neq 0$)

$$\frac{2ab + a}{a}$$

A. $2b$
B. $2ab$
C. $2b + 1$
D. cannot be simplified

16. Joe's age is shown by the expression $t - 12$, where t represents Tanya's age. If Tanya is 16, how old is Joe?

A. 4
B. 12
C. 14
D. 28

17. A rectangular solid has the following dimensions:
length = 6 millimeters
width = 4 millimeters
height = 2 millimeters

Find the volume. ($V = lwh$)

A. 12 mm^3
B. 14 mm^3
C. 20 mm^3
D. 48 mm^3

18. A clothing store at the mall had 34 sweaters in stock at the beginning of a sale. If x represents the number of sweaters sold during the sale, which expression shows the number of sweaters remaining?

A. $x - 34$
B. $x + 34$
C. $34 - x$
D. $34x$

19. Which statement is represented by the algebraic expression $10 - x$?

A. Tamara is x years old. How old was she 10 years ago?
B. Sumito is 10 years old. How old will he be in x years?
C. Ann is x years younger than Sheldon. How old is Sheldon?
D. Alfonso is 10 years old. How old was he x years ago?

Answers to Sample Questions

1. C	6.C	11.B	16.A
2. C	7.A	12.C	17.D
3. D	8.D	13.D	18.C
4. C	9.C	14.C	19.D
5. B	10.B	15.C	

GHSGT in Math ~ Student Remediation Plan

You may find that this checklist will help you keep track of the areas in which you need to concentrate your study. Be sure to keep the checklist updated!

Student Name _____
Test Results from *Spring* ___ *Summer* ___ *Fall* ___ *Winter* ___

Standards on the Test	***Self Assessment***
Number and Computation *Scale Score* = _____	
Expresses numbers in equivalent and approximate forms and orders these forms, using appropriate tools such as calculators (includes fractions, decimals, percent; scientific notation; square and cube roots, and second and third powers of whole numbers; approximations of fractions, decimals, and percents.)	
Recognizes, describes, and applies certain patterns for addition and multiplication.	
Selects and uses problem-solving strategies and computational tools (mental computation, calculator, estimation, paper and pencil) to solve simple problems involving career, consumer, and leisure applications; and evaluates reasonableness of results.	
Determines amounts of money including price, amounts of change, discounts, sales prices, sales tax, interest, and best buy.	
Uses estimation strategies such as rounding, front-end estimation, clustering, grouping, adjusting, compensation, and reference point to predict computational results.	
Uses estimation and approximation to check the reasonableness of computational results.	
Recognizes appropriate practical situations in which to use and to expect results with exact and approximate numbers.	

Standards on the Test	***Self Assessment***
Data Analysis *Scale Score* = _____	
Uses probability correctly to predict outcomes of given events, determines the probability of an event through experiments, and differentiates odds from probability.	
Collects (through surveys and experiments) and organizes data into tables, charts, graphs, and diagrams.	
Organizes information using tables, charts, and a variety of graph types with appropriate labels and scales, and interprets such displays as those found in public media.	
Reads and interprets tables, charts, graphs, and diagrams.	
Recognizes a wide variety of occupational situations in which information is gathered and displayed, using tables, charts, and graphs.	

Determines the mean, median, mode, and range of data and uses these measures to describe the set of data.	
Applies simple statistical techniques to problem-solving situations.	

Standards on the Test	*Self Assessment*
Measurement and Geometry *Scale Score* = _____	
Estimates measures in both customary and metric systems.	
Estimates and solves problems involving measurement, including selecting appropriate tools such as calculator or mental calculation.	
Applies customary or metric units of measure to determine length, area, volume/capacity, weight/mass, time, and temperature (includes evaluating reasonableness and precision of results, and reading different scales).	
Identifies items from real life that are commonly measured in metric, customary, or in both systems of units, as well as recognizing the appropriate-sized units to use.	
Identifies and differentiates between similar and congruent figures and identifies figures that have been transformed by rotation, reflection, and translation.	
Uses proportions to find missing lengths of sides of similar figures and to enlarge or reduce figures.	
Solves problems involving similar figures and scale drawings.	
Graphs points in the coordinate plane, identifies the coordinates, and uses the concept of coordinates in problem situations, such as reading maps.	
Finds the perimeter and area of plane figures (such as polygons, circles, composite figures) and surface area and volume of simple solids (such as rectangular prisms, pyramids, cylinders, cones, spheres).	
Calculates perimeter and area of plane figures; finds appropriate measures of objects and their models prior to such calculations for basic polygons and circles.	
Identifies lines, angles, circles, polygons, cylinders, cones, rectangular solids, and spheres in everyday objects.	
Applies geometric properties, such as the sum of the angles of a polygon property, percent of area of a circle determined by the central angle measure in a pie chart, or parallel sides and angle relations for parallelograms, to practical drawings.	
Draws and measures angles; determines the number of degrees in the interior angles of geometric figures, such as right and straight angles, circles, triangles, and quadrilaterals; and classifies angles (right, acute, obtuse, complementary, supplementary) and triangles (right, acute, obtuse, scalene, isosceles, and equilateral).	
Uses the Pythagorean Theorem to solve problems (includes selecting appropriate tools such as the calculator).	
Applies ratios to similar geometric figures, as in scale drawings, as well as with mixtures and compound applications.	

Standards on the Test	*Self Assessment*
Algebra *Scale Score* = _____	
Simplifies expressions with and without grouping symbols.	
Evaluates simple algebraic expressions.	
Substitutes known values in formulas and solves problems with formulas.	
Identifies and applies mathematics to practical problems requiring direct and inverse proportions.	
Translates words into simple algebraic expressions and equations.	

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