Georgia High School Graduation Tests

Test Content Description
for

Number Computations

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Revised October 2002

Mathematics QCC Standard: Number and Computation (M.9-12)

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). (M2)

TEST CONTENT DESCRIPTION

The focus will be on recognizing multiple representations of numbers, ordering numbers that are in similar forms or different forms, and determining which number is equivalent when numbers are not expressed in similar form. Items will be multiple-choice in format. Information will be presented verbally, and diagrams may be added for clarification. Items may require converting from one form to another (e.g., percent to decimal), identifying a point on a number line, or identifying the closest decimal equivalent to a given fraction, or finding a number "between." Most responses will be numerical, and usually all options in an item will be of the same form (i.e., all percents, all fractions). Incorrect responses should represent common errors in the ways that numbers are expressed.

Mathematics: Number and Computation QCC Standards (M.9-12)

Sample Items

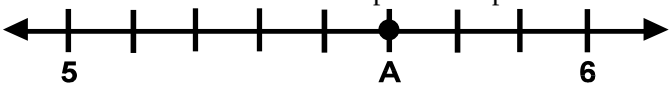
1. Which answer is .87 written as a percent?

   A. .87%
   B. 8.7%
   C 87%
   D. 870%

2. What is another way to express 64?

   A. 8^2
   B. 3^4
   C. 6^4
   D. 6.4×10^2

3. Which answer shows the number that point A represents on the graph?



   A. $5\frac{1}{2}$
   B. $5\frac{5}{8}$
   C. $6\frac{1}{4}$
   D. $5\frac{3}{4}$

4. Angelica read to her brother for $\frac{1}{4}$ of an hour. How many minutes did she read?

   A. 4
   B. 15
   C. 25
   D. 40

Mathematics QCC Standard: Number and Computation (M.9-12)

Recognizes, describes, and applies certain patterns for addition and multiplication.
(replacement for M3)

TEST CONTENT DESCRIPTION

The focus will be on the identification and/or application of various number properties (associative, commutative, identity, inequality, and inverse). Whenever possible, test items should include real-world examples of the number properties listed.

One type of test item will present real-world activities and ask the student to identify the activity which illustrates a specific number property. Other items will give a property and ask the student to select the appropriate numerical response.

Mathematics QCC Standard: Number and Computation (M.9-12)

Sample Items

1. Which of the following pairs of activities could be used to illustrate the commutative property?

   A. writing on the chalkboard and erasing the chalkboard
   B. putting a dime and a quarter into a vending machine
   C. putting on your shoes and socks
   D. turning on a lamp at night and reading a book

2. During the first year of operation, the noise level at the county airport was recorded as d decibels. In the second year, the noise level increased by 35 decibels, and in the third year it increased again by 40 decibels. The noise level after 3 years could be expressed as $(d + 35) + 40$.

   Use the associative property to write an equivalent expression.

   A. $d = 35 + 40$
   B. $d + (35 + 40)$
   C. $35d + 40$
   D. $d(35 + 40)$

3. Carla knows the identity element for addition is zero. What is the identity element for multiplication?

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

Mathematics QCC Standard: Number and Computation (M.9-12)

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. (M4)

TEST CONTENT DESCRIPTION

The focus of this standard, for assessment purposes, will be on choosing the correct computational tool (mental computation, calculator, estimation, paper and pencil, computer) to solve simple problems. Test items will present students with familiar situations involving educational, career, consumer, and leisure applications of mathematics. Students will be asked to choose the best tool to use in each situation. The computational tools used in answer choices are limited to those listed in the expanded standard.

Mathematics QCC Standard: Number and Computation (M.9-12)

Sample Items

1. As you drive along U.S. 41, you see a sign stating that Griffin is 28 miles away. Which would be the **most** appropriate method to estimate how long it will take you to get to Griffin at 55 miles per hour?

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

2. Brendan makes $12 an hour doing yard work during the 10 weeks of summer vacation. If Brendan averages 30 hours per week, what is a reasonable estimate of what Brendan will earn during the summer?

   A. $120.00
   B. $360.00
   C. $660.00
   D. $3600.00

Mathematics QCC Standard: Number and Computation (M.9-12)

Determines amount of money including price, amounts of change, discounts, sales prices, sales tax, interest, and best buy. (M5)

TEST CONTENT DESCRIPTION

The focus will be on solving practical problems with consumer, career, or leisure applications. Students are to be presented with problem situations chosen from real-life applications of mathematics, such as spending money, making change, paying interest, or doing comparison shopping. The reasoning within the context of the activity should be emphasized. Computation will be minimal, and numbers used in test items will be restricted to those that can be easily manipulated without the use of calculators. Test items will present information about a money-handling situation. Graphics may be used when necessary to clarify the information in the problem. Incorrect responses should represent common mistakes in performing arithmetic operations on amounts of money or errors in finding a mathematical model for a given word problem.

Mathematics QCC Standard: Number and Computation (M.9-12)

Sample Items

1. If shoes which originally cost $24.00 are selling at a 25% discount, what is the amount of the discount?

   A. $6.00
   B. $8.00
   C. $12.00
   D. $18.00

2. If Juanita borrows $6,000 to buy a car at a fixed interest rate of 13% per year, how much interest must she pay if she pays the loan in full at the end of one year?

   A. $78
   B. $565
   C. $780
   D. $6013

3. Maureen works in a small crafts store where the cash register does not compute the sales tax. If the sales tax is 6%, what amount should Maureen add to a purchase of $18.50?

   A. $0.06
   B. $0.55
   C. $1.11
   D. $1.85

Mathematics QCC Standard: Number and Computation (M.9-12)

Uses estimation strategies such as rounding, front-end estimation, clustering, grouping, adjusting, compensation, and reference point to predict computational results. (M6)

Uses estimation and approximation to check the reasonableness of computational results. (M7)

TEST CONTENT DESCRIPTION

Using estimation strategies (as listed in the standard), the student will predict answers and determine reasonable answers to problems which might arise in real-world situations. Estimation in a testing situation in which calculator use is encouraged is actually measured as knowledge of estimation procedures. Most questions should require the student to correctly identify an estimation procedure or apply a given procedure correctly. Test items for this standard will use estimation strategies both in solving problems and in checking the reasonableness of results.

Students will be presented with problem-solving situations they might encounter in consumer, school, career, or leisure applications of mathematics. Any realistic quantities may be used in the test items, but the situation presented in the problem should make estimation necessary. The focus will be on the estimate rather than on recognizing or naming a particular estimation strategy (e.g., clustering).

Items may be of two types:

* Finding the best estimate of a given set of numbers.
* Using estimation to verify a reasonable answer.

Correct answers will be accurate and reasonable approximations of the exact answer. Incorrect responses will be off by an order of magnitude or will reflect the incorrect use of estimation techniques. Incorrect responses may **NOT** include the precise answer. If the response items are numerical expressions, only one can be correct. The other three must be clearly incorrect.

Mathematics QCC Standard: Number and Computation (M.9-12)

Sample Items

1. What is the **best** estimate of a 15% tip on a $14.00 meal?

   A. $1.00
   B. $1.40
   C. $2.00
   D. $2.80

2. Masheela's science grades were 95, 90, 75, 80, 90, 90. What is a reasonable estimate of her average grade in science?

   A. 95
   B. 90
   C. 85
   D. 80

3. Estimate the sum of 62, 59, 55, 67, and 61.

   A. 300
   B. 305
   C. 400
   D. 500

Mathematics QCC Standard: Number and Computation (M.9-12)

Recognizes appropriate practical situations in which to use and to expect results with exact and approximate numbers. (M9)

TEST CONTENT DESCRIPTION

Test items should be chosen from practical situations such as a student might encounter at home, at school, or in a leisure or occupational setting. Most items will be in the form of a list of situations from which the student is to choose the one situation in which to use or to expect results with exact or approximate numbers. Items should only assess the student's knowledge of when exact or approximate numbers are appropriate. Items should not require the student to make exact computations or estimate approximate results. Incorrect responses should reflect confusion about situations where exact numbers and results are not expected or where approximate results and numbers are inappropriate.

Mathematics QCC Standard: Number and Computation (M.9-12)
Sample Items

1. Choose the situation from the list below where a result using **approximate** numbers would **most likely** be acceptable.

   A. David made a table to show how many gold, silver, and bronze medals were won in the 1996 Atlanta Summer Olympics by the U.S., Canada, Germany, Romania, Britain, and China.
   B. The student council is planning a cookout. Scott needs to determine how many hamburgers, hot dogs, and rolls are needed for the event.
   C. Jason is the treasurer for his band. He has to keep a record of receipts and expenses and then pay the band members out of the profits.
   D. Tom is responsible for counting the items in stock at the supermarket so the manager will know which items he needs to re-order.

2. Choose the situation where **exact** numbers would **most likely** be involved.

   A. Mr. Howard pays an electrician for installing a ceiling fan.
   B. John wants to take Sandra out after the baseball game and checks to see if he has enough money.
   C. Mr. Dobson is the school librarian and is asked by a reporter for the school paper how many books are in the library.
   D. Janice is working part-time at a local supermarket. She makes a budget to help her plan how to spend the money she earns.

3. Choose the situation where **exact** numbers would **most likely** be expected.

   A. The Roselli family is preparing a budget for a two-week vacation in Tennessee.
   B. Mack went to a rock concert last week. He told his friend Ira how many people were at the concert.
   C. The school paper wants to report on the number of fish eggs that hatched in the library aquarium last week.
   D. Scott has been put on a 1,000 calorie-per-day diet and must plan his food intake each day so that he does not exceed that amount.