Georgia High School Graduation Tests

Test Content Description
for

Probability, Statistics
& Data Analysis

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Revised October 2002

Mathematics QCC Standard: Probability, Statistics, and Data Analysis (M.9-12)

Uses probability correctly to predict outcomes of given events, determines the probability of an event through experiments, and differentiates odds from probability. (M10)

TEST CONTENT DESCRIPTION

The focus of the items will be on applying the rules of probability and predicting the chance of a designated outcome for a specific given event. The odds of an event (the ratio of the number of ways the event can occur to the number of ways the event cannot occur) will also be addressed.

Students are presented with situations they might encounter in everyday life—at home, at school, or in a leisure or occupational setting. The item may ask the student to determine the probability or the odds of an outcome taking place. Both single and combination (dependent or independent) events should be used in test items. Some situations in which the probability of an event occurring is either 1 or 0 should be included.

Items may be presented in verbal or pictorial form. The principal task presented to the student is to determine the probability of a given event, given sufficient information. The phrase "chance of __________ happening" should be avoided, as this is usually expressed as a percent.

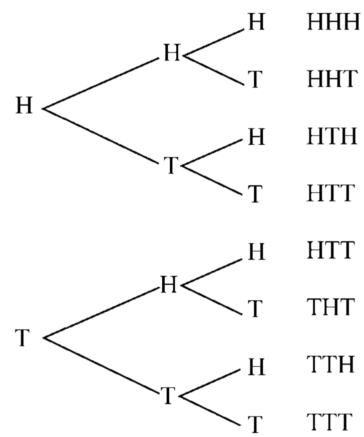
All responses should be written as a ratio. Incorrect responses should reflect lack of knowledge or confusion about probabilities, such as finding the number of possible outcomes incorrectly, or incorrectly determining the number of ways an event can occur. Incorrect answers should not be other forms of the correct ratio, such as a fraction that is not simplified.

Sample Items	**★ Key**	**Cognitive Level**

Medium

1. Use the tree diagram to predict the probability of flipping three coins and getting all heads or all tails.

OUTCOME



★ A. $\frac{1}{4}$

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

C. 1

D. 2

Medium

2. If a coin is tossed five times and on the first four tosses it comes up tails, what is the probability of getting heads on the fifth toss?

A. 0

★ B. $\frac{1}{2}$

C. $\frac{4}{5}$

D. 1

Medium

3. There are five pencils in a box; some are red and some are blue. The probability of randomly reaching into the box and selecting a red pencil is $\frac{3}{5}$. How many blue pencils are in the box?

A. 1
★ B. 2
C. 3
D. 5

Mathematics QCC Standard: Probability, Statistics, and Data Analysis (M.9-12)

Collects (through surveys and experiments) and organizes data into tables, charts, graphs, and diagrams. (M11)

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. (M12)

TEST CONTENT DESCRIPTION

Test items will present to students data from situations they might encounter in school, on the job, or in leisure settings. Since all test items will be multiple-choice in format, students cannot be asked to *construct* graphs and/or tables. Responses will show various representations of the data, and the student's task will be to identify the correct or appropriate choice.

Other types of items may present information in graph or table form and ask the student to interpret the information. In this case, the answer choices will be numerical values. Incorrect responses will reflect incorrect interpretations of data.

Sample Items ★ **Key** **Cognitive Level**

Low

1. Which kind of graph is **best** used to show a percent or share of the total?

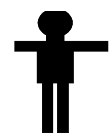
    A. bar graph
    ★ B. circle graph
    C. line graph
    D. pictograph

Medium

2. Larami is making a pictograph for the high school newspaper to show the number of students in each grade who are in favor of open lunch. She summarized her data:

Grade	Number of students in favor of open lunch
Seniors	125
Juniors	150
Sophomores	75
Freshmen	50

In the pictograph, how many students could be **best** represented by this symbol?



    A. 1
    ★ B. 25
    C. 50
    D. 100

High

3. The results of a poll asking, "Who is your favorite late-night talk-show host?" are shown.

Keenan Ivory Wayans......... 20%
David Letterman 23%
Jay Leno.............................. 32%
undecided............................ 25%

Which type of graph should be used to show the results of the poll?

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

Mathematics QCC Standard: Probability, Statistics, and Data Analysis (M.9-12)

Reads and interprets tables, charts, graphs, and diagrams. (M13)

Recognizes a wide variety of occupational situations in which information is gathered and displayed, using tables, charts, and graphs. (M14)

TEST CONTENT DESCRIPTION

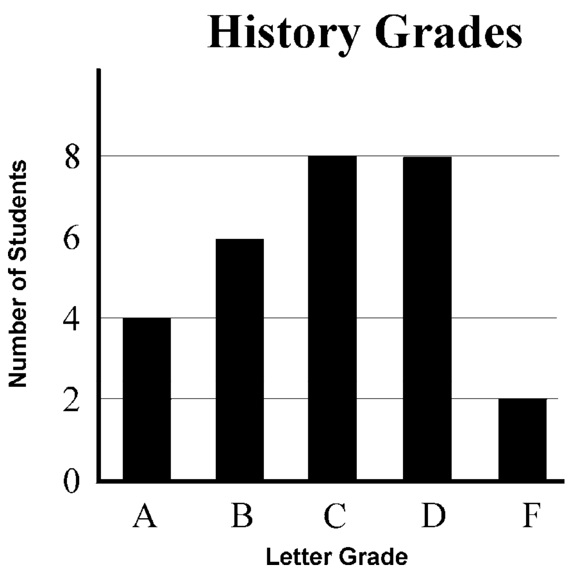
The focus will be on interpreting tables, charts, graphs, and diagrams used in consumer, career, school, home, or leisure settings. Test items will make use of a variety of tables, such as time tables, tax tables, tables of measure, interest rate tables, and tables of squares and square roots. Venn diagrams and bar, line, circle, and picture graphs will be presented for interpretation. Diagrams, tables, charts, and graphs should be carefully drawn and labeled.

Some multiple-choice items will require numerical answer choices which may be real numbers or a range of numbers. Other multiple-choice responses will be given in words that describe or interpret problem situations. Incorrect answer choices will reflect errors in computation or interpretation of data.

Sample Items ★ **Key** **Cognitive Level**

Medium

1.



The distribution of grades in Mr. Paul's history class is shown on the graph above. How many more C students than A students are in his class?

A. 0
B. 2
★ C. 4
D. 8

Medium

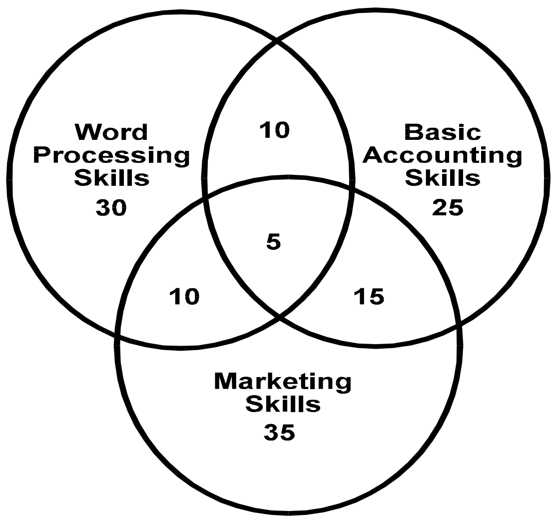
2. The distribution of grades in Mr. Paul's history class is illustrated by the graph. What is the ratio of A students to C students in his class?

A. 1:4
B. 2:1
★ C. 1:2
D. 4:1

Sample Items ★ **Key** **Cognitive Level**

Medium

3. Mr. Mangione, the Director of Human Resources at Ace Chemical Industries, constructed a diagram to illustrate the skills of applicants for positions in the office of his company.



How many applicants possess word processing, basic accounting, and marketing skills?

★ A. 5
B. 10
C. 15
D. 20

4. **Medium**

Ready-to-cook Weight (pounds)	**Approximate Time at 325°F (hours)**
4 to 8	3 to 4 ½
8 to 12	4 ½ to 4 :
12 to 16	4 : to 5 :
16 to 20	5 : to 6
20 to 24	6 to 7

Todd is planning to roast an 18-pound stuffed turkey. What is the **least** amount of time he should allow for roasting the turkey at 325°F?

A. 4 ½ hours
★ B. 5 ¾ hours
C. 6 hours
D. 7 hours

Mathematics QCC Standard: Probability, Statistics, and Data Analysis (M.9-12)

Determines the mean, median, mode, and range of data and uses these measures to describe the set of data. (M15)

Applies simple statistical techniques to problem-solving situations. (M16)

TEST CONTENT DESCRIPTION

The student will be presented with data drawn from real-world situations that might occur at home, at school, on the job, or in a leisure setting. Data may be presented as a word problem or in a table or chart. This table or chart should be included in the stem of the item. Items should typically have seven or more entries for the calculation of mean, median, or mode. Bimodal or other unusual distributions should be avoided.

Incorrect responses might reflect confusion in naming the statistical measures or major miscalculations that reflect errors in applying the method of finding a particular statistical measure. Minor miscalculations should not be used as incorrect multiple-choice responses. Decimals may be rounded off; and, in any one item, each response should be carried to the same number of decimal places.

Sample Items ★ **Key** **Cognitive Level**

Medium

1. The scores on Mrs. Jackson's physics test were 87, 92, 50, 65, 88, 87, 91, 60, 65, 75, 70, 82, 85, 89, 80, 80, 75, 77, 92, and 80. What is the range of the scores?

★ A. 42
B. 50
C. 78
D. 80

Medium

2. The Country Coffee Shop has seven employees. Their salaries are $11,000, $12,000, $12,000, $14,000, $16,000, $17,000, and $17,500. What is the average salary of a coffee shop employee?

A. $6,500
B. $12,000
C. $14,000
★ D. $14,214

High

3. Helen spent a total of $100 for five shirts. Later she bought another shirt. She spent an average of $18.78 per shirt for the six shirts. What did Helen pay for the sixth shirt?

★ A. $12.68
B. $16.67
C. $20.00
D. $38.78

Medium

4. The youngest person in an audience of 600 people is thirteen years old. The range of ages is forty-five years. Which is the age of the oldest member of the audience?

A. 32 years
B. 45 years
C. 46 years
★ D. 58 years