

Alaska

Comprehensive System of Student Assessment (CSSA)

Grade 10 Standards Based Assessments–High School
Graduation Qualifying Examination
(SBA–HSGQE)

Mathematics Practice Test Scoring Guide



Fall 2010

Alaska Department of Education & Early Development

Mathematics Practice Test Scoring Guide

with Answer Keys, Scoring Guidelines, and Sample Papers

General Introduction

The Alaska Department of Education and Early Development (EED), in cooperation with Data Recognition Corporation, designed and produced the Alaska Practice Test to support students in doing their best on the Alaska Comprehensive System of Student Assessment, *Standards Based Assessments* in grade 10. A scoring guide, with answer keys, scoring guidelines, sample student papers, and a test map, provides the teacher with information and tools to score each practice test.

Content

A *Practice Test Scoring Guide* for each grade level and subject area is posted on the EED Website (<http://www.eed.state.ak.us/tls/assessment>). To access this website, follow these instructions.

Directions to access the AK EED Website

1. Type or copy and paste the link to the Alaska EED Website into your browser.
<http://www.eed.state.ak.us/tls/assessment>
2. Select Standards Based Assessments.
3. Select Practice Tests Grades 3–10.
4. Select the grade-level assessment (or other document) you wish to download.
5. At this point you may save the file to your computer or print the file directly from the website. Printing from the website can be very time consuming. It is likely you will want to save the file(s) to your computer, then print.

This guide is divided into two sections. Section I includes the answer keys and scoring guidelines (with detailed item-specific scoring rubrics for scoring short and extended constructed-response questions) and sample student papers with annotations for each score point. Section II presents a grade-level test map that lists item sequence, corresponding Grade Level Expectation and/or Performance Standard, and an answer key.

Purpose

The passages, stimuli, prompts, graphs, charts, and items included for each content-area practice test are being released directly from the Alaska item bank for use in Alaska classrooms. These materials may be copied and used as part of a local instructional program.* Alaska educators may use the reading, writing, and mathematics practice tests, the *Practice Test Administration Directions*, and the *Practice Test Scoring Guides* to support daily instruction in the classroom and to prepare their students for the operational assessments.

Important: The practice tests are presented for usability purposes only, and in no way should the tests or scores students receive be considered a predictor of a student’s ability to perform on the operational assessments. Passages, prompts, stimuli, and items provide samples of what students will see on the operational tests.

*The permission to copy and/or use these materials does not extend to commercial purposes.

Item Format

The mathematics practice test includes two types of mathematics items: multiple choice and constructed response. Practice test multiple-choice items have four answer options. The correct response to each multiple-choice item is worth one point.

Two types of constructed-response items may be presented in the mathematics practice test: short constructed response (SCR) are 2-point items; extended constructed response (ECR) are 4-point items. Item-specific scoring guidelines and examples of responses for each score point are presented with each constructed-response item.

Measurement items may be included in the mathematics practice test. Note that when teachers download the practice tests from the Alaska Education and Early Development Website (<http://www.eed.state.ak.us/tls/assessment>) and print them on local computers, measurement items (that require a ruler) may be scaled differently from the actual figure that appears on the PDF, and true measurement cannot be achieved. Teachers are encouraged, however, to continue to include measurement items on their regular classroom tests.

Scoring Guidelines

Following the multiple-choice answer key are general scoring rubrics for 2-point, 4-point constructed-response items. The general scoring rubric includes item-specific guidelines to assist the teacher with scoring constructed-response items.

Sample student papers are included for each short and extended constructed-response score point. An item-specific annotation follows each sample student response. The annotations are designed to provide the teacher with the explanation of why the score point was awarded.

Test Maps

The test map presents the sequence of the items, the Grade Level Expectation and/or Performance Standard to which each item is aligned, and the answer key. This at-a-glance chart is designed to assist the teacher with scoring the practice test.

**SECTION I: Grade 10 Mathematics Practice Test Answer Keys,
Scoring Guidelines, and Sample Student Papers**

1. C
2. D
3. A
4. D
5. D
6. A
7. B
8. D
9. C
10. C
11. D
12. C
13. The amount of precipitation in Juneau for the month of March was 4 inches. In April, the amount of precipitation in Juneau decreased by 20% from the amount that fell in March. How many inches of precipitation did Juneau get in April? Show the work necessary to solve the problem, and write the answer on the line below. This item is worth 2 points.

Show the work.

Answer: _____ inches

**SECTION I: Grade 10 Mathematics Practice Test Answer Keys,
Scoring Guidelines, and Sample Student Papers**

13. Short Constructed Response

Score	Rubric
2	2 of 2 parts correct
1	1 of 2 parts correct OR Some correct and relevant work or explanation
0	Response is totally incorrect or irrelevant

- Correct amount of precipitation
- Correct support (procedures) to find the precipitation

Problem Solution:

- 3.2 (inches) or $3\frac{1}{5}$ (inches)
- $4 \times (1 - 0.20) = 4 \times 0.80 = 3.2$
or
 $4 - 4 \times 0.20 = 4 - 0.8 = 3.2$

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Item #13 Response Score: 2

Short Constructed Response:

Show the work.

$$\begin{array}{r} .20 \\ \times 4 \\ \hline .80 \end{array} \qquad \begin{array}{r} 3.00 \\ - .80 \\ \hline 3.20 \end{array}$$

Answer: 3.2 inches

Annotation for score point: 2

Two of 2 parts correct:

1. Correct amount of precipitation (3.2).
2. Correct support (procedures) to find the precipitation (finds 20% and subtracts from 4 inches).

**SECTION I: Grade 10 Mathematics Practice Test Answer Keys,
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Item #13 Response Score: 1

Short Constructed Response:

Show the work.

$$\begin{array}{r} .20 \\ + 4 \\ \hline .80 \end{array} \qquad \begin{array}{r} .20 \\ \times 10 \\ \hline 2 \end{array}$$

Answer: 3.2 inches

Annotation for score point: 1

One of 2 parts correct:

1. Correct amount of precipitation (3.2).
2. Insufficient support shown to find the precipitation (does not show subtraction of 0.8 from 4).

**SECTION I: Grade 10 Mathematics Practice Test Answer Keys,
Scoring Guidelines, and Sample Student Papers**

Item #13 Response Score: 0

Short Constructed Response:

Show the work.

$$4 \text{ inches} - 20\% = x$$

$$4 - \underline{20\%} = x$$

$$4 - .2 = x$$

$$3.8 = x$$

Answer: 3.8 inches

Annotation for score point: 0

No parts correct:

1. Incorrect answer.
2. Incorrect support (procedural error of subtracting .2 from 4).

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Scoring Guidelines, and Sample Student Papers**

- 14. B
- 15. B
- 16. D
- 17. A
- 18. B
- 19. D
- 20. A
- 21. B

**SECTION I: Grade 10 Mathematics Practice Test Answer Keys,
Scoring Guidelines, and Sample Student Papers**

22. Ted has 8 cereal bowls in his kitchen. There are 3 green bowls, 2 pink bowls, and 3 yellow bowls. He randomly chooses 1 of these bowls each day for his cereal. Each bowl is washed and replaced before the next day. The table below shows Ted's cereal bowl color use for the past 100 days. This item is worth 4 points.

CEREAL BOWL COLOR USE

Color	Number of Times Used
green	42
pink	20
yellow	38

What is the theoretical probability of choosing a pink bowl? Explain your thinking and write the answer on the line below.

Answer: _____

What is the experimental probability of choosing a pink bowl? Explain your thinking and write the answer on the line below.

Answer: _____

SECTION I: Grade 10 Mathematics Practice Test Answer Keys, Scoring Guidelines, and Sample Student Papers

22. Extended Constructed Response

Score	Rubric
4	4 of 4 parts correct
3	3 of 4 parts correct
2	2 of 4 parts correct
1	1 of 4 parts correct OR Some correct and relevant work or explanation
0	Response is totally incorrect or irrelevant

- Correct theoretical probability
- Correct support (procedure) to explain how to find theoretical probability
- Correct experimental probability
- Correct support (procedure) to explain how to find experimental probability

Note: If the student has only “ $\frac{\text{number of pink bowls}}{\text{number of total bowls}}$,” for explanation of experimental probability, it will **not** be sufficient for credit of explanation. For the explanation of theoretical probability, it will be sufficient for credit of explanation.

Problem Solution:

- $\frac{2}{8}$ or $\frac{1}{4}$ or 25% or 0.25 or equivalent written on the blank or clearly identified as theoretical probability
- Theoretical probability is found by taking $\frac{\text{actual number of pink bowls}}{\text{actual number of total bowls}}$.
The response must refer to use of actual given number of bowls, not values from table.
- $\frac{20}{100}$ or $\frac{1}{5}$ or 0.20 or 20% or equivalent written on the blank or clearly identified as experimental probability
- Experimental probability is found by taking $\frac{\text{number of pink bowls used in trials}}{\text{number of total bowls used in trials}}$.
The response must make some reference to the need to use information in the table.

**SECTION I: Grade 10 Mathematics Practice Test Answer Keys,
Scoring Guidelines, and Sample Student Papers**

Item #22 Response Score: 4

Extended Constructed Response:

What is the theoretical probability of choosing a pink bowl? Explain your thinking and write the answer on the line below.

I think it's a 25% probability because if you add 3, 2, and 3 together, it equals 8. 8 is the total and there's 2 pink bowls. So, $\frac{2}{8}$ equals $\frac{1}{4}$, equalling 25%.

Answer: 25%

What is the experimental probability of choosing a pink bowl? Explain your thinking and write the answer on the line below.

I say it is 20% because out of 100 days, the bowl has been picked 20 times. So, it is only a $\frac{20}{100}$ meaning a 20% chance of picking it.

Answer: 20%

Annotation for score point: 4

Four of 4 parts correct:

1. Correct theoretical probability.
2. Correct support to explain theoretical probability. The quantities used in the explanation are labeled as "total" and "pink."
3. Correct experimental probability.
4. Correct support using the information from the table and includes labeling the quantities used (100 days).

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Item #22 Response Score: 3

Extended Constructed Response:

What is the theoretical probability of choosing a pink bowl? Explain your thinking and write the answer on the line below.

*If there are
8 bowls all
together and
only 2 pink
bowls then he
only has 2/8
chance of getting
a pink bowl*

Answer: $\frac{2}{8}$

What is the experimental probability of choosing a pink bowl? Explain your thinking and write the answer on the line below.

$\frac{20}{100} - \frac{1}{5}$

Answer: $\frac{1}{5}$

Annotation for score point: 3

Three of 4 parts correct:

1. Correct theoretical probability.
2. Correct support for theoretical probability (8 bowls all together and 2 pink bowls).
3. Correct experimental probability ($1/5$).
4. Insufficient support for experimental probability (quantities need to be labeled).

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Item #22 Response Score: 2

Extended Constructed Response:

What is the theoretical probability of choosing a pink bowl? Explain your thinking and write the answer on the line below.

I think there's a 33.33% of choosing the pink bowl because all of the bowls have a theoretical probability of 33.33%. The pink bowl could be chosen $\frac{1}{3}$ times of 100 which is 33.33%.

Answer: 33.33%

What is the experimental probability of choosing a pink bowl? Explain your thinking and write the answer on the line below.

According to the data above, pink bowl was chosen 20 times out of 100 times. So if you take the percentage of how many times it has been chosen you'll get 20%.

Answer: 20%

Annotation for score point: 2

Two of 4 parts correct:

1. Incorrect theoretical probability and support.
2. Correct experimental probability (20%).
3. Correct support for the experimental probability that uses the information from the table and correctly labels it (20 times out of 100 times).

**SECTION I: Grade 10 Mathematics Practice Test Answer Keys,
Scoring Guidelines, and Sample Student Papers**

Item #22 Response Score: 1

Extended Constructed Response:

What is the theoretical probability of choosing a pink bowl? Explain your thinking and write the answer on the line below.

$\frac{2}{8}$ which is $\frac{1}{4}$

Answer: $\frac{1}{4}$

What is the experimental probability of choosing a pink bowl? Explain your thinking and write the answer on the line below.

Answer: $\frac{1}{4}$

Annotation for score point: 1

One of 4 parts correct:

1. Correct theoretical probability (1/4).
2. Insufficient support for the theoretical probability because the quantities 2 and 8 have not been labeled.
3. Incorrect experimental probability and no attempt at support.

SECTION I: Grade 10 Mathematics Practice Test Answer Keys,
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Item #22 Response Score: 0

Extended Constructed Response:

What is the theoretical probability of choosing a pink bowl? Explain your thinking and write the answer on the line below.

I think the chance is very very hard
of him getting a pink bowl

Answer: 20% chance

$$\begin{array}{r} 142 \\ + 20 \\ \hline 80 \\ + 20 \\ \hline 100 \end{array}$$

What is the experimental probability of choosing a pink bowl? Explain your thinking and write the answer on the line below.

I think the experimental
probability would be $\frac{20}{80}$

Answer: $\frac{20}{80}$

Annotation for score point: 0

No parts correct:

1. Incorrect answers.
2. Incorrect support (no evidence of understanding is shown).

**SECTION I: Grade 10 Mathematics Practice Test Answer Keys,
Scoring Guidelines, and Sample Student Papers**

- 23. D
- 24. D
- 25. C
- 26. D
- 27. C
- 28. B
- 29. D
- 30. C
- 31. A
- 32. C

SECTION II: Grade 10 Mathematics Test Map


Mathematics			
Sequence	GLE	HSGQE	Key
1	NA	M1.2.2	C
2	NA	M2.4.2	D
3	NA	M6.2.6 (6.2.5)	A
4	NA	M4.3.5	D
5	S&P-1	M6.3.1	D
6	NA	M1.2.5	A
7	N-2	M1.4.4	B
8	NA	M2.2.6	D
9	NA	M3.3.6	C
10	E&C-2	M3.4.3 (3.4.2)	C
11	S&P-2	M6.3.2	D
12	NA	M5.2.2	C
13	NA	M3.3.4	Short Constructed Response
14	N-4	M1.4.3	B
15	NA	M2.3.5	B
16	NA	M5.2.3	D

* Numbers in parentheses reference corresponding standard in the fourth edition of the Alaska Standards document.

SECTION II: Grade 10 Mathematics Test Map

Mathematics			
Sequence	GLE	HSGQE	Key
17	F&R-5	M4.4.3	A
18	NA	M1.3.1	B
19	NA	M4.3.4	D
20	NA	M6.1.5 (6.1.4)	A
21	E&C-2	M3.4.4 (3.4.3)	B
22	S&P-5	NA	Extended Constructed Response
23	G-1	NA	D
24	MEA-1	NA	D
25	F&R-1	NA	C
26	F&R-6	NA	D
27	F&R-3	NA	C
28	NA	M2.3.4	B
29	G-5	M5.3.4	D
30	G-7	NA	C
31	S&P-1	NA	A
32	E&C-3	NA	C

* Numbers in parentheses reference corresponding standard in the fourth edition of the Alaska Standards document.



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