Alaska

Comprehensive System of Student Assessment (CSSA)

Mathematics Practice Test Scoring Guide

Grade 10 SBA–HSGQE
HSGQE Retest



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 Item Samplers / Practice Tests.
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 were created 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 were developed 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. Items are not necessarily the same in terms of measurement, rigor, or the length of time it takes a student to respond.

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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 are 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 are not included in the mathematics practice test because teachers will 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. When printing occurs using 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 include measurement items on their regular classroom tests.

Scoring Guidelines

Following the multiple-choice answer key are general scoring rubrics for 2-point and 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. B
2. B
3. D
4. A
5. C
6. B
7. Jenny incorrectly simplified $4^2 \times 4^3$ and got an answer of 16^6. Explain what Jenny did wrong, and write the correct answer on the line below. This item is worth 2 points.

Answer: _____

7. Short Constructed Response

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

- Explanation of error in bases
- Explanation of error in exponents
- Correct answer

Problem Solution:

- Jenny multiplied the bases. (When multiplying two exponential terms that have the same bases, the base remains the same and not $4 \times 4 = 16$) or equivalent
- Jenny multiplied the exponents. (When multiplying two exponential terms that have the same bases, one adds the exponents [$2 + 3 = 5$], not multiplies them) or equivalent
- 4^5 or 2^{10} or 1024 or equivalent

Item #7 **Response Score: 2**

Short Constructed Response:

She multiplied the two 4's and multiplied the exponents. the 4 should remain and the exponents could be added

$4^2 \cdot 4^3 = 4^5$

Answer: 4^5

Annotation for score point: 2

Three of 3 parts correct:

1. Correct explanation of error in bases ("She multiplied the two 4s" . . . "the 4 should remain [unchanged]")
2. Correct explanation of error in exponents (". . . multiplied the exponents . . . should be added")
3. Correct answer of 4^5

Item #7 **Response Score: 1**

Short Constructed Response:

She multiplied 4·4 & 2·3 and got 16^6

$64 \cdot 16$

$\frac{16}{4}$

Answer: 306

Annotation for score point: 1

Two of 3 parts correct:

1. Correct explanation of error in bases ("She multiplied 4 ● 4 . . . and got [base] 16 . . .")
2. Correct explanation of error in exponents ("She multiplied 2 ● 3 . . . and got [exponent] 6")
3. Incorrect answer of 306

Item #7 **Response Score: 0**

Short Constructed Response:

Jenny, you multiplied 4 x 4, but you really should add them and get 8.

Answer: 46

Annotation for score point: 0

No parts correct:

1. *Incorrect* answer of 4^6
2. No correct explanation

8. D
9. C
10. A
11. A
12. C
13. D
14. The table shows the production of chairs at a furniture factory with respect to the number of weeks from the beginning of the year. This item is worth 4 points.

CHAIR PRODUCTION

Number of Weeks	Chairs Produced
3	450
6	900
9	1,350
12	1,800
15	2,250

Write an equation in slope-intercept form ($y = mx + b$) that models the situation.

Show the work.

The pattern continues. How many weeks will it take the factory to make 5,250 chairs?

Show the work.

Answer: _____ weeks

14. 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 (e.g., correct value of slope without support and with no work)
0	Response is incorrect or irrelevant

- Correct equation
- Correct work shown for obtaining the equation
- Correct number of weeks or number of weeks based on student's equation (error carried through if incorrect)
- Correct work shown for calculating the number of weeks

Problem Solution:

- $y = 150x$ or equivalent (variables may be different but must be an equation)
- slope $= \frac{900 - 450}{6 - 3} = \frac{450}{3} = 150$ and $450 = 150 \bullet 3 + b$ and $450 - 450 = b = 0$

  thus, y-intercept = 0 and does not need to be in the equation
- 35 (weeks) or answer based on an incorrect equation in Part A
- $\frac{5250}{150} = 35$ or equivalent (may see repeated subtractions that account for blocks of weeks—e.g., 5250 – 2250 = 3000 for 15 weeks, etc.)

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

Item #14 **Response Score: 4**

Extended Constructed Response:

CHAIR PRODUCTION

Number of Weeks	Chairs Produced
3	450
6	900
9	1,350
12	1,800
15	2,250

Points
3,450
6,900
9,1350
12,1800
15,2250

Write an equation in slope-intercept form ($y = mx + b$) that models the situation.

Show the work.

weeks = x
1/= chairs
$y = 150x + 0$

$\frac{900-450}{6-3} = \frac{450}{3} = 150$

$y = 150x + b$
$1350 = 150(9) + b$
$b = 0$

The pattern continues. How many weeks will it take the factory to make 5,250 chairs?

Show the work.

$5{,}250 = 150x$
$35 = x$

Answer: 35 **weeks**

Annotation for score point: 4

Four of 4 parts correct:

1. Correct equation ($y = 150x + 0$)
2. Correct work shown for equation (uses $\frac{\Delta y}{\Delta x} = m$ to find slope & substitutes in number of weeks and chairs to find y-intercept)
3. Correct number of weeks (35)
4. Correct work shown for number of weeks ($5{,}250 = 150x$)

Item #14 **Response Score: 3**

Extended Constructed Response:

CHAIR PRODUCTION

Number of Weeks x	Chairs Produced y
3	450
6	900
9	1,350
12	1,800
15	2,250

Write an equation in slope-intercept form ($y = mx + b$) that models the situation.

Show the work.

150
3 | 450
3↓
15
15↓
00

$y = 150x$

The pattern continues. How many weeks will it take the factory to make 5,250 chairs?

Show the work.

$\frac{5,250}{150} = \frac{150x}{150}$

$35 = x$

0035
150 | 5250
450↓
0750
700
000

Answer: 35 **weeks**

Annotation for score point: 3

Three of 4 parts correct:

1. Correct equation ($y = 150x$)
2. Insufficient work shown for equation (does not address y-intercept)
3. Correct number of weeks (35)
4. Correct work shown for number of weeks ($\frac{5250}{150} = \frac{150x}{150}$)

Item #14 **Response Score: 2**

Extended Constructed Response:

CHAIR PRODUCTION

Number of Weeks	Chairs Produced
3	450
6	900
9	1,350
12	1,800
15	2,250

Write an equation in slope-intercept form ($y = mx + b$) that models the situation.

Show the work. ~~w~~ = weeks y = chairs

w(1) = 150

$\frac{y}{450} = x$

The pattern continues. How many weeks will it take the factory to make 5,250 chairs?

Show the work.

5250 × 3 = 15750

450 | 15750 → 35

450 × 3 = 1350

450 × 5 = 2250

Answer: 35 **weeks**

Annotation for score point: 2

Two of 4 parts correct:

1. Incorrect equation ($y/450 = x$)
2. No correct work shown for equation
3. Correct number of weeks (35)
4. Correct work shown for number of weeks ($5250 \times 3 = 15750$ *and* $450\overline{)15750}$)

Item #14 **Response Score: 1**

Extended Constructed Response:

CHAIR PRODUCTION

Number of Weeks	Chairs Produced
3	450
6	900
9	1,350
12	1,800
15	2,250

X Y

Write an equation in slope-intercept form ($y = mx + b$) that models the situation.

Show the work. $Y = mx + b$

$\frac{450 = m3 + b}{3 \quad 3}$

$150 = m + b$

The pattern continues. How many weeks will it take the factory to make 5,250 chairs?

Show the work. $\frac{3}{450} = \frac{x}{5,250}$ $\frac{450x = 16,050}{450 \quad 450}$ $x = 35\frac{2}{3}$

$45 \overline{)1605}$ -135 255 -225 30

$45 \times 5 = 225$ $45 \times 3 = 135$

Answer: It'll take $35\frac{2}{3}$ weeks

Annotation for score point: 1

One of 4 parts correct:

1. Incorrect equation ($150 = m + b$)
2. Incorrect work shown for equation
3. Incorrect number of weeks ($35\frac{2}{3}$) due to calculation error
4. Correct work shown for number of weeks

Item #14 **Response Score: 0**

Extended Constructed Response:

CHAIR PRODUCTION

x Number of Weeks	y Chairs Produced
3	450
6	900
9	1,350
12	1,800
15	2,250

Write an equation in slope-intercept form ($y = mx + b$) that models the situation.

Show the work.

$y = mx + b$

$450 = m(3) + b$

The pattern continues. How many weeks will it take the factory to make 5,250 chairs?

Show the work.

$5{,}250 = m(x) + b$

Answer: _____ **weeks**

Annotation for score point: 0

No parts correct:

Response is incorrect or irrelevant

15. B
16. B
17. A
18. B
19. C
20. D

SECTION II: Grade 10 Mathematics Test Map

Mathematics			
Sequence	**GLE**	**HSGQE**	**Key**
1	N-1	NA	B
2	G-1	NA	B
3	S&P-1	M6.2.1	D
4	E&C-3	M3.3.4	A
5	F&R-1	M4.3.2	C
6	S&P-5	NA	B
7	N-2	M1.4.4	Short Constructed Response
8	MEA-1	NA	D
9	G-4	NA	C
10	N-5	NA	A
11	N-7	M1.4.7	A
12	S&P-2	M6.3.2	C
13	G-3	M5.2.3	D
14	F&R-2/F&R-1	M4.4.2 M4.3.1	Extended Constructed Response
15	E&C-2	NA	B
16	MEA-1	NA	B
17	F&R-2	NA	A
18	S&P-4	NA	B
19	S&P-6	NA	C
20	F&R-7	NA	D



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