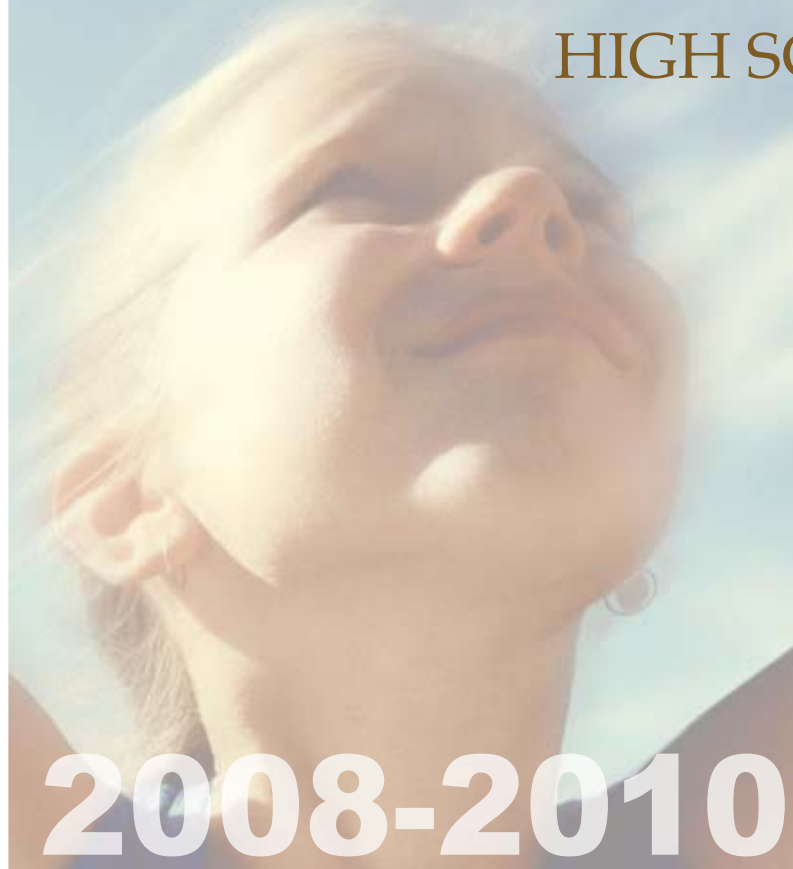


SAMPLE TEST

MATHEMATICS

HIGH SCHOOL



Calculation and Estimation

Measurement

Statistics and Probability

Algebraic Relationships

Geometry

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Office of Assessment & Information Services
Oregon Department of Education
255 Capitol Street NE
Salem, OR 97310
(503) 947-5600



Susan Castillo
State Superintendent of Public Instruction

Doug Kosty
Assistant Superintendent

Tony Alpert
Director, Assessment and Evaluation

Steve Slater
Manager, Scoring, Psychometrics and Validity

Kathleen Vanderwall
Manager, Test Design and Administration

Ken Hermens
Language Arts Assessment Specialist

Leslie Phillips
Science, and Social Sciences Assessment Specialist

James Leigh
Mathematics Assessment Specialist

Dianna Carrizales
Extended Assessment Specialist

Sheila Somerville
Electronic Publishing Specialist

INTRODUCTION TO MATHEMATICS KNOWLEDGE AND SKILLS GRADE-LEVEL SAMPLE TESTS

BACKGROUND

The Oregon Department of Education provides sample tests to demonstrate the content and types of questions students in grades 3, 4, 5, 6, 7, 8, and High School might encounter on the Oregon Assessment of Knowledge and Skills (multiple-choice), which is administered each year.

ELIGIBLE CONTENT

These sample questions were taken from previous years' tests. They were designed to measure each student's knowledge of mathematics in each of the five content strands:

- 1. Calculations and Estimations:**
numbers; computation and estimation; operations and properties
- 2. Measurement:**
units and tools; and direct and indirect measurement
- 3. Statistics and Probability:**
statistics; probability; collect and display data; data analysis and predictions
- 4. Algebraic Relationships:**
patterns and functions; algebraic relationships; modeling; and change
- 5. Geometry:**
properties and relationships; modeling; coordinate geometry; and transformations and symmetry.

As in the operational assessment, students are **strongly encouraged** to use the calculator with which they are most familiar when taking the sample test.

The answer key provided at the end of the sample test booklet identifies which of these categories each question is designed to assess.

The same weighting across the five strands of mathematics content is used in both sample and operational tests. This chart shows the percent weighting of strands by grade level:

	1	2	3	4	5
3	25	20	15	20	20
4	20	20	20	20	20
5	20	20	20	20	20
6	15	20	20	25	20
7	15	15	20	30	20
8	15	15	20	30	20
HS	10	10	20	35	25

WHY PROVIDE STUDENTS WITH A SAMPLE TEST?

Most students feel some anxiety as they approach a test. The more confident students feel about their knowledge of the topic, the less anxious they feel. It also is important that students feel comfortable with the test format and are familiar with test-taking strategies to help them achieve the best possible score.

CONTENTS OF THE SAMPLE TEST:

This overview of the purpose for sample tests is followed by a list of test-taking tips. The sample test formatting is the same as a paper/pencil operational mathematics test. A "fill-in-the-bubble" answer sheet for the students to practice with follows the actual sample test. The answer key identifies the correct answer, the score reporting category represented, and a conversion of number correct to approximate RIT scale score. The sample test has fewer items than the actual assessment, and may not be used in place of the operational assessment.

USING THE SAMPLE TEST:

Teachers often have their students take the test as a “practice” activity in preparation for the actual Statewide Assessment. In addition to the practice in reading and answering questions, some students may benefit from an opportunity to practice marking bubbles on a separate answer sheet. The answer key could be removed prior to making copies of the sample test for student practice. Copies of the answer key could then be provided to students to check their work or to take home and share with parents.

It is important to remember that **students are encouraged to use their calculators and any mathematics manipulatives** on the test. Providing these tools in class and encouraging students to use them during the sample test may be very beneficial in encouraging students to take their time and use the appropriate tools to help them solve problems during the actual test administration. In fact, teachers may want to demonstrate how various tools could be used to solve the multiple-choice problems as part of the practice test activities.

Teachers may use the overall class results to target areas of instruction needing further attention.

Parents may find the sample test helpful in clarifying the types of questions their child will encounter on the multiple-choice test. Parents could also assist their child in preparing for the test by practicing at home. The list of test-taking tips gives parents suggestions on ways to reduce test anxiety and promote good study and health habits in preparation for testing.

Students may wish to use the test independently to practice before the actual test administration, checking their own responses against the answer key provided at the end of the booklet. Students may benefit from re-reading the problems and analyzing both the correct and incorrect answers to the multiple-choice questions they missed.

Building principals, superintendents, district testing coordinators, curriculum leaders and others may find the sample test useful in communicating with parents, school site councils, and other community members. Parts of the sample test could be included in a newsletter or shared at meetings of local community groups to help constituents better understand the state assessment system. Although the sample tests are not as comprehensive as the complete tests administered in the Statewide Assessment, they do provide a **sampling** of the subject area content and difficulty level students will encounter as a part of Oregon’s high academic standards.

Assessment Conditions

If the practice test is to be administered in “test-like” conditions, the following steps need to be followed:

- post a “testing, do not disturb” sign on the window or door of the classroom
- go over any directions (e.g., students are to complete the entire test or only a portion of the test at one sitting)
- expect the students to work by themselves with no talking during the assessment
- monitor student activities during the assessment
- provide any of the appropriate accommodations or modifications students use during instruction and might need during testing
- expect all students to participate

TEST-TAKING TIPS

BEFORE THE TEST

- Develop a positive attitude. Tell yourself, “I will do my best on this test.”
- Get a good night’s sleep the night before the test.
- Get up early enough to avoid hurrying to get ready for school.
- Eat a good breakfast (and lunch, if your test is in the afternoon).

DURING THE TEST

- Stay calm.
- Listen carefully to directions.
- Read each test question and all the answer choices carefully.
- Eliminate any obvious wrong answers
- Solve the problem using paper and pencil, a calculator or by using manipulatives. See if your answer is similar to one of the choices given.
- Pace yourself. If you come to a difficult question, it may be better to skip it and go on. Then come back and focus on the difficult questions one at a time. However, going back is a strategy that can only be used when taking a paper/pencil test, not on OAKS Online
- Just like the Statewide Assessment, this is not a timed test. If you need more time to finish the test, notify your teacher.
- Remember the test questions are not arranged by difficulty. If you get to a question you think is too hard, that doesn’t mean the rest of the test questions will also be too hard.
- The teachers who write the test questions use “commonly made mistakes” to identify good distractors, so finding an answer like yours is not a guarantee that it is the correct answer.

- If you are not sure of an answer to a question, try these tips:
 - ◇ Get rid of the answers you know are not correct and choose among the rest.
 - ◇ Read through all the answers very carefully, and then go back to the question. Sometimes you can pick up clues just by thinking about the different answers you have to choose from.
 - ◇ If you get stuck on a question, skip it and come back later.
 - ◇ It is OK to guess on this test. Try to make your best guess, but make sure you answer all questions.

AFTER THE TEST

- Before you turn your test in, check it over. Change an answer only if you have a good reason. Generally it is better to stick with your first choice.
- Make sure you have marked an answer for every question, even if you had to guess.
- Make sure your answer sheet is clearly marked with dark pencil. Erase any stray marks.

ADDITIONAL INFORMATION on mathematics assessment may be obtained by contacting James Leigh, Mathematics Assessment Specialist, email to: James.Leigh@state.or.us

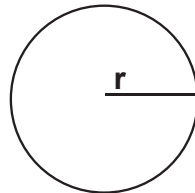
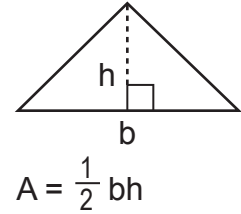
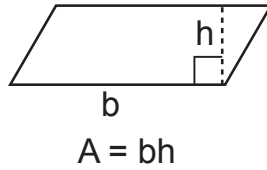
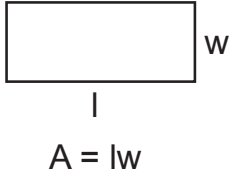
MEASUREMENTS

1 meter = 100 centimeters
 1 kilometer = 1000 meters
 1 yard = 3 feet
 1 mile = 5280 feet
 1 hour = 60 minutes
 1 minute = 60 seconds

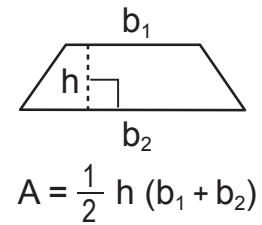
1 gram = 1000 milligrams
 1 kilogram = 1000 grams
 1 pound = 16 ounces
 1 ton = 2000 pounds

1 liter = 1000 cubic centimeters
 1 cup = 8 fluid ounces
 1 pint = 2 cups
 1 quart = 2 pints
 1 gallon = 4 quarts

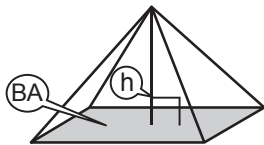
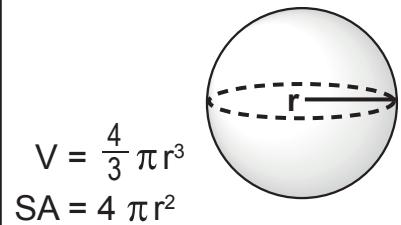
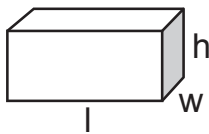
AREA (A)



Length of an arc = $\frac{m}{360} \times 2 \pi r$

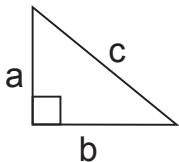
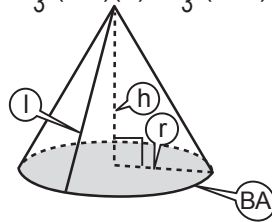


SURFACE AREA (SA) and VOLUME (V)

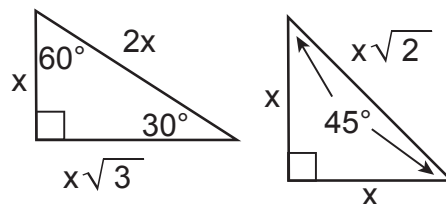
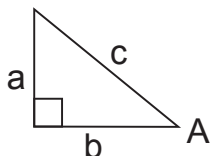
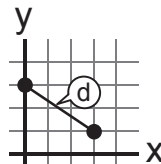


$SA = (LA) + (BA)$
 LA = lateral area
 BA = Base Area

$V = \frac{1}{3} (BA)(h) = \frac{1}{3} (\pi r^2)(h)$



$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$



Quadratic Formula
 $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

DIRECTIONS

Read each of the questions below and then decide on the BEST answer.

1

Which of the following tools is used to measure the number of degrees in an angle?

- A. Caliper
- B. Compass
- C. Micrometer
- D. Protractor

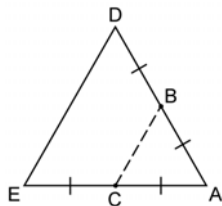
2

Simplify:

$$-13x + (-7x) + 5x$$

- A. $-25x$ B. $-15x$ C. $15x$ D. $25x$

3



If this triangle is folded along the dotted line, where will point A end up?

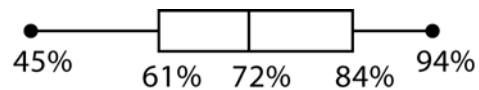
- A. In the interior of $\triangle ADE$
- B. On the exterior of $\triangle ADE$
- C. The midpoint of \overline{ED}
- D. On line BC

4

Which number has the greatest value?

- A. 3.1^5
- B. 4.2×10^2
- C. 3100
- D. 200^2

5



The box-and-whisker plot represents the average grades on the semester final in Mrs. Chambers' math class. If the trend remains the same this year, what will the median score of the class be?

- A. 69.5%
- B. 71.2%
- C. 72%
- D. 72.5%

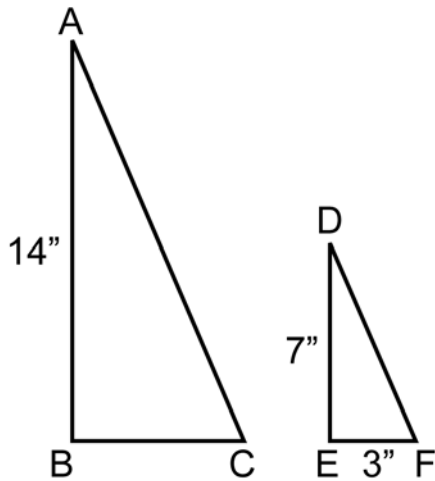
6

There are 6 snakes in a certain valley. The population of snakes doubles every year. In how many years will there be 96 snakes?

- A. 2 B. 3 C. 4 D. 8

Mathematics ▼

7



$\triangle ABC \sim \triangle DEF$

What is the measure of \overline{BC} ?

- A. 4"
- B. 5"
- C. 6"
- D. 7"

8

Josh and Andrea each have \$10.50. Josh spends all his money and buys 2 hamburgers and 3 sodas. Andrea spends \$7.50 and buys 2 hamburgers and one soda.

What is the cost of one hamburger?

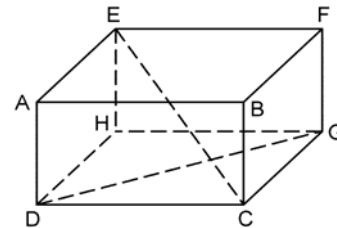
- A. \$1.50
- B. \$2.50
- C. \$3.00
- D. \$8.75

9

Determine the midpoint of a segment whose endpoints are $(-3, 4)$ and $(3, 10)$.

- A. $(0, 7)$
- B. $(3, 7)$
- C. $(0, -3)$
- D. $(-3, 3)$

10



Given the right rectangular prism, which of the following statements must be true?

- A. $\overline{EC} \cong \overline{DG}$
- B. $\overline{DH} \cong \overline{GF}$
- C. $\angle CDG \cong \angle CEH$
- D. $\overline{HG} \cong \overline{AB}$

11

Solve the system of equations:

$$\begin{aligned} a + b &= -7 \\ 4a + 2b &= 22 \end{aligned}$$

- A. $a = -7.5$
 $b = -14.5$
- B. $a = 18$
 $b = -25$
- C. $a = 2$
 $b = -9$
- D. $a = 22$
 $b = -7$

12

In a survey of 500 consumers, each was asked to select their favorite cheese-slicers from among four distinct models.

The results were as follows: “whatsits” – 100, “thingamajigs” – 125, “gizmos” – 150, and “widgets” – 125.

If 600,000 cheese-slicers are sold, then how many of them should be “gizmos?”

- A. 120,000
- B. 150,000
- C. 180,000
- D. 420,000

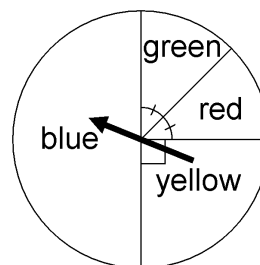
13

Triangle ABC is rotated 45° about point C in a clockwise direction. What is the relationship between triangle ABC and its image A'B'C'?

- A. They are congruent.
- B. Each side of A'B'C' is 45 times as large as the sides of ABC.
- C. Each angle of A'B'C' is 45° larger than the angles of ABC.
- D. They have no relationship to each other.

14

The blue part is $\frac{1}{2}$ of the spinner. The yellow part is $\frac{1}{4}$ of the spinner. The red and green parts are the same size. James spins the spinner 80 times. About how many times should it land in the green part?



- A. 10
- B. 20
- C. 40
- D. 60

15

A tank contains 5 gallons of water. It is leaking at a rate of 4 gallons per hour. The situation is modeled by $G = -4t + 5$ where “t” represents time in hours. How long until the tank contains only 3 gallons of water?

- A. $t = -2$ hrs.
- B. $t = -\frac{1}{2}$ hrs.
- C. $t = \frac{1}{2}$ hr.
- D. $t = 2$ hrs.

16

Line CD is a line of symmetry for $\triangle ABC$. What can you conclude?

- A. $\overline{AD} \cong \overline{DB}$
- B. $\angle A \cong \angle B$
- C. $\overline{AC} \cong \overline{BC}$
- D. All of the above

Mathematics ▼

17

Which number has the greatest value?

- A. $\left(\frac{1}{2}\right)^4$
- B. $\sqrt{5}$
- C. $\frac{7}{3}$
- D. 2.324

18

Find the solution to the following system of two linear equations:

$$\begin{aligned} Y &= 9x - 3 \\ 4x + 2y &= 5 \end{aligned}$$

- A. $\left(\frac{1}{2}, \frac{3}{11}\right)$
- B. $\left(\frac{1}{2}, \frac{3}{2}\right)$
- C. $\left(\frac{8}{13}, 2\frac{7}{13}\right)$
- D. $\left(\frac{11}{13}, 4\frac{7}{13}\right)$

19

A standard deck of cards has 26 red cards and 26 black cards. 2 cards are drawn out of the deck. What is the probability the second card is red, given the first card was black. (The first card was not replaced in the deck before the second card was drawn.)

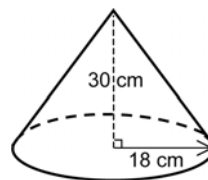
- A. $\frac{50}{51}$
- B. $\frac{26}{52}$
- C. $\frac{26}{51}$
- D. $\frac{25}{52}$

20

The coordinates of point A are (-5, 3). If A is reflected over the y-axis, then translated 3 units right and 4 units down, the new coordinates of A are:

- A. (5, 3)
- B. (8, -1)
- C. (-2, -1)
- D. (-2, -7)

21



The volume of the cone is ? cm^3 .

- A. 2592π
- B. 3240π
- C. 7776π
- D. 9720π

22

Which formula best describes the table of values shown?

x	y
-3	81
-2	36
-1	9
0	0
1	9
2	36
3	81

- A. $y = -27x$ C. $y = (3x)^2$
 B. $y = 27x$ D. $y = 3x^2$

23

The equations of two lines are:

$$3x - 2y = 11$$

$$2x + y = 5$$

If the lines are graphed, at what point do they intersect?

- A. (-1, 3) C. (3, -10)
 B. (3, -1) D. $(4, \frac{1}{2})$

24

A man spent $\frac{1}{2}$ of his life in Mexico, $\frac{1}{3}$ of his life in America, $\frac{1}{7}$ of his life in Brazil, and his remaining 2 years in Argentina. How old was he when he moved to Argentina?

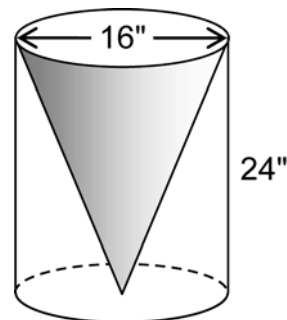
- A. 80 yrs. old
 B. 82 yrs. old
 C. 84 yrs. old
 D. 86 yrs. old

25

Joe has two fair dice (faces numbered 1-6) and a fair coin. He rolls the dice and tosses the coin. What is the probability Joe rolls one three (3), one four (4), and tosses a head?

- A. $\frac{1}{216}$ B. $\frac{1}{36}$ C. $\frac{1}{24}$ D. $\frac{5}{6}$

26



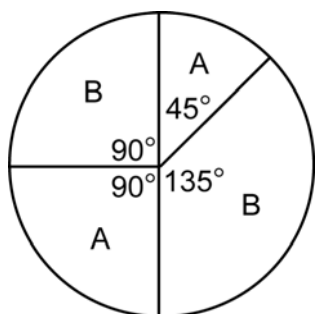
What is the volume left in the cylinder after the shaded cone region is removed?

- A. $1,024\pi \text{ in.}^3$ C. $2,048\pi \text{ in.}^3$
 B. $1,536\pi \text{ in.}^3$ D. $4,096\pi \text{ in.}^3$

Mathematics ▼

27

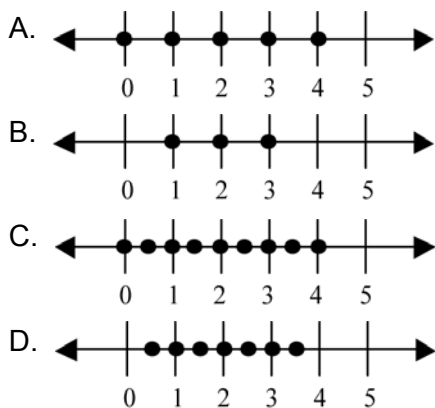
If you spin the spinner two times, what is the probability it will land on A both times?



- A. $\frac{1}{4}$ B. $\frac{3}{8}$ C. $\frac{6}{8}$ D. $\frac{9}{64}$

28

Which set of points on the graph represents a set of integers strictly between 0 and 4?



29

Which expression gives the greatest value if $a = 6$ and $b = -10$?

- A. $a - \frac{b}{a}$
 B. $a \div (a - b)$
 C. $a^2 \div (a - b)$
 D. $a \div a - b^2$

30

The library on campus is shaped like a regular polygon. Gayle finds the measurement of one of the interior angles of the library to be 165.6° . Using the measurement of the angle, Gayle determines the library has ___ sides.

- A. 13
 B. 15
 C. 25
 D. 38



Oregon Mathematics Sample Test

Use number 2 pencil.
Do NOT use ink or ball point pen.
Make heavy dark marks that completely fill the circle.
Erase completely any marks you wish to change.

Name of Student

Name of Teacher

Name of School

- | | | | | | |
|----|-----------------|----|-----------------|----|-----------------|
| 1 | (A) (B) (C) (D) | 11 | (A) (B) (C) (D) | 21 | (A) (B) (C) (D) |
| 2 | (A) (B) (C) (D) | 12 | (A) (B) (C) (D) | 22 | (A) (B) (C) (D) |
| 3 | (A) (B) (C) (D) | 13 | (A) (B) (C) (D) | 23 | (A) (B) (C) (D) |
| 4 | (A) (B) (C) (D) | 14 | (A) (B) (C) (D) | 24 | (A) (B) (C) (D) |
| 5 | (A) (B) (C) (D) | 15 | (A) (B) (C) (D) | 25 | (A) (B) (C) (D) |
| 6 | (A) (B) (C) (D) | 16 | (A) (B) (C) (D) | 26 | (A) (B) (C) (D) |
| 7 | (A) (B) (C) (D) | 17 | (A) (B) (C) (D) | 27 | (A) (B) (C) (D) |
| 8 | (A) (B) (C) (D) | 18 | (A) (B) (C) (D) | 28 | (A) (B) (C) (D) |
| 9 | (A) (B) (C) (D) | 19 | (A) (B) (C) (D) | 29 | (A) (B) (C) (D) |
| 10 | (A) (B) (C) (D) | 20 | (A) (B) (C) (D) | 30 | (A) (B) (C) (D) |

High School MATHEMATICS SAMPLE TEST KEY 2008 – 2010

Test Item	Correct Answer	Score Reporting Category	SRC Coding
1	D	Measurement	2.1.C1
2	B	Algebraic Relationships	4.2.C5
3	C	Geometry	5.1.C3
4	D	Calculations and Estimations	1.1.C3
5	C	Statistics and Probability	3.4.C2
6	C	Algebraic Relationships	4.2.C2
7	C	Geometry	5.1.C7
8	C	Algebraic Relationships	4.2.C4
9	A	Geometry	5.3.C2
10	D	Geometry	5.1.C7
11	B	Algebraic Relationships	4.2.C4
12	C	Statistics and Probability	3.4.C2
13	A	Geometry	5.4.C7
14	A	Statistics and Probability	3.2.C2
15	C	Algebraic Relationships	4.2.C2
16	D	Geometry	5.4.C7
17	C	Calculations and Estimations	1.1.C1
18	B	Algebraic Relationships	4.2.C4
19	C	Statistics and Probability	3.2.C3
20	B	Geometry	5.4.C4
21	B	Measurement	2.2.C11
22	C	Algebraic Relationships	4.1.C3
23	B	Algebraic Relationships	4.2.C4
24	B	Algebraic Relationships	4.3.C1
25	B	Statistics and Probability	3.2.C1
26	A	Measurement	2.2.C15
27	D	Statistics and Probability	3.2.C1
28	B	Calculations and Estimations	1.1.C9
29	A	Algebraic Relationships	4.2.C6
30	C	Geometry	5.1.C5

CONVERTING TO A RIT SCORE

Number Correct	RIT score	Number Correct	RIT score
1	194.3	16	233.7
2	201.9	17	235.4
3	206.6	18	237.1*
4	210.1	19	238.9
5	213.0	20	240.7
6	215.5	21	242.6
7	217.8	22	244.6
8	219.8	23	246.8**
9	221.8	24	249.1
10	223.6	25	251.7
11	225.4	26	254.8
12	227.1	27	258.5
13	228.8	28	263.3
14	230.4	29	271.1
15	232.1	30	278.4

* Likely to meet HS Standards

** Likely to exceed HS Standards

Note: The sample test is for practice only; scores may not be substituted for the Oregon Statewide Assessment.

Oregon Department of Education

255 Capitol St NE, Salem, Oregon 97310 (503) 947-5600
High School