FOR TEACHERS ONLY

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY (Common Core)

Friday, June 16, 2017 — 9:15 a.m. to 12:15 p.m., only

SCORING KEY AND RATING GUIDE

Mechanics of Rating

The following procedures are to be followed for scoring student answer papers for the Regents Examination in Geometry (Common Core). More detailed information about scoring is provided in the publication *Information Booklet for Scoring the Regents Examination in Geometry (Common Core)*.

Do *not* attempt to correct the student's work by making insertions or changes of any kind. In scoring the open-ended questions, use check marks to indicate student errors. Unless otherwise specified, mathematically correct variations in the answers will be allowed. Units need not be given when the wording of the questions allows such omissions.

Each student's answer paper is to be scored by a minimum of three mathematics teachers. No one teacher is to score more than approximately one-third of the open-ended questions on a student's paper. Teachers may not score their own students' answer papers. On the student's separate answer sheet, for each question, record the number of credits earned and the teacher's assigned rater/scorer letter.

Schools are not permitted to rescore any of the open-ended questions on this exam after each question has been rated once, regardless of the final exam score. Schools are required to ensure that the raw scores have been added correctly and that the resulting scale score has been determined accurately.

Raters should record the student's scores for all questions and the total raw score on the student's separate answer sheet. Then the student's total raw score should be converted to a scale score by using the conversion chart that will be posted on the Department's web site at: http://www.p12.nysed.gov/assessment/ on Friday, June 16, 2017. Because scale scores corresponding to raw scores in the conversion chart may change from one administration to another, it is crucial that, for each administration, the conversion chart provided for that administration be used to determine the student's final score. The student's scale score should be entered in the box provided on the student's separate answer sheet. The scale score is the student's final examination score.

If the student's responses for the multiple-choice questions are being hand scored prior to being scanned, the scorer must be careful not to make any marks on the answer sheet except to record the scores in the designated score boxes. Marks elsewhere on the answer sheet will interfere with the accuracy of the scanning.

Part I

Allow a total of 48 credits, 2 credits for each of the following. Allow credit if the student has written the correct answer instead of the numeral 1, 2, 3, or 4.

(1) 2	(9) 2	(17) . . . . . 4 . . . . .
(2) 3	(10) 2	(18) . . . . . 1 . . . . .
(3) 3	(11) 4	(19) . . . . . 2 . . . . .
(4) 4	(12) 1	(20) . . . . . 2 . . . . .
(5) 4	(13) 1	(21) . . . . . 4 . . . . .
(6) 3	(14) . . . . . *	(22) . . . . ** . . . .
(7) 1	(15) 2	(23) . . . . . 3 . . . . .
(8) 2	(16) 1	(24) . . . . ** . . . .

* **Question 14** — When scoring this question, either choice 1 or choice 3 should be awarded credit.

** **Questions 22 and 24** — When scoring these questions, all students should be awarded credit regardless of the answer, if any, they record on the answer sheet for this question.

Updated information regarding the rating of this examination may be posted on the New York State Education Department's web site during the rating period. Check this web site at: http://www.p12.nysed.gov/assessment/ and select the link "Scoring Information" for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and several times throughout the Regents Examination period.

The Department is providing supplemental scoring guidance, the "Model Response Set," for the Regents Examination in Geometry (Common Core). This guidance is intended to be part of the scorer training. Schools should use the Model Response Set along with the rubrics in the Scoring Key and Rating Guide to help guide scoring of student work. While not reflective of all scenarios, the Model Response Set illustrates how less common student responses to constructed-response questions may be scored. The Model Response Set will be available on the Department's web site at: http://www.nysedregents.org/geometrycc/.

General Rules for Applying Mathematics Rubrics

I. General Principles for Rating

The rubrics for the constructed-response questions on the Regents Examination in Geometry (Common Core) are designed to provide a systematic, consistent method for awarding credit. The rubrics are not to be considered all-inclusive; it is impossible to anticipate all the different methods that students might use to solve a given problem. Each response must be rated carefully using the teacher's professional judgment and knowledge of mathematics; all calculations must be checked. The specific rubrics for each question must be applied consistently to all responses. In cases that are not specifically addressed in the rubrics, raters must follow the general rating guidelines in the publication *Information Booklet for Scoring the Regents Examination in Geometry (Common Core)*, use their own professional judgment, confer with other mathematics teachers, and/or contact the State Education Department for guidance. During each Regents Examination administration period, rating questions may be referred directly to the Education Department. The contact numbers are sent to all schools before each administration period.

II. Full-Credit Responses

A full-credit response provides a complete and correct answer to all parts of the question. Sufficient work is shown to enable the rater to determine how the student arrived at the correct answer.

When the rubric for the full-credit response includes one or more examples of an acceptable method for solving the question (usually introduced by the phrase "such as"), it does not mean that there are no additional acceptable methods of arriving at the correct answer. Unless otherwise specified, mathematically correct alternative solutions should be awarded credit. The only exceptions are those questions that specify the type of solution that must be used; e.g., an algebraic solution or a graphic solution. A correct solution using a method other than the one specified is awarded half the credit of a correct solution using the specified method.

III. Appropriate Work

Full-Credit Responses: The directions in the examination booklet for all the constructed-response questions state: "Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc." The student has the responsibility of providing the correct answer ***and*** showing how that answer was obtained. The student must "construct" the response; the teacher should not have to search through a group of seemingly random calculations scribbled on the student paper to ascertain what method the student may have used.

Responses With Errors: Rubrics that state "Appropriate work is shown, but…" are intended to be used with solutions that show an essentially complete response to the question but contain certain types of errors, whether computational, rounding, graphing, or conceptual. If the response is incomplete; i.e., an equation is written but not solved or an equation is solved but not all of the parts of the question are answered, appropriate work has ***not*** been shown. Other rubrics address incomplete responses.

IV. Multiple Errors

Computational Errors, Graphing Errors, and Rounding Errors: Each of these types of errors results in a 1-credit deduction. Any combination of two of these types of errors results in a 2-credit deduction. No more than 2 credits should be deducted for such mechanical errors in a 4-credit question and no more than 3 credits should be deducted in a 6-credit question. The teacher must carefully review the student's work to determine what errors were made and what type of errors they were.

Conceptual Errors: A conceptual error involves a more serious lack of knowledge or procedure. Examples of conceptual errors include using the incorrect formula for the area of a figure, choosing the incorrect trigonometric function, or multiplying the exponents instead of adding them when multiplying terms with exponents.

If a response shows repeated occurrences of the same conceptual error, the student should not be penalized twice. If the same conceptual error is repeated in responses to other questions, credit should be deducted in each response.

For 4- and 6-credit questions, if a response shows one conceptual error and one computational, graphing, or rounding error, the teacher must award credit that takes into account both errors. Refer to the rubric for specific scoring guidelines.

Part II

For each question, use the specific criteria to award a maximum of 2 credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(25) **[2]** A correct construction is drawn showing all appropriate arcs.

[1] An appropriate construction is drawn showing all appropriate arcs, but an altitude is drawn from a vertex other than J.

or

[1] An appropriate construction is drawn showing all appropriate arcs, but the altitude is missing or incorrect.

[0] A drawing that is not an appropriate construction is shown.

or

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

(26) **[2]** 2.25π or an equivalent area in terms of pi is written, and appropriate work is shown.

[1] Appropriate work is shown, but one computational error is made.

or

[1] Appropriate work is shown, but one conceptual error is made.

or

[1] 2.25π, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

(27) **[2]** A complete and correct explanation is written.

[1] An appropriate explanation is written, but one conceptual error is made.

or

[1] An incomplete or partially correct explanation is written.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

(28) **[2]** 0.6, and correct work is shown.

[1] Appropriate work is shown, but one computational or rounding error is made.

or

[1] Appropriate work is shown, but one conceptual error is made.

or

[1] 0.6, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

(29) **[2]** A complete and correct explanation is written.

[1] An explanation that contains one conceptual error is written.

or

[1] A correct explanation of why one pair of angles is congruent is written.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

(30) **[2]** A correct sequence of transformations is written.

[1] An appropriate sequence of transformations is written, but one conceptual error is made.

or

[1] An appropriate sequence of transformations is written, but it is incomplete.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

(31) **[2]** $y = -\frac{3}{4}x + 5$ or an equivalent equation is written, and a correct explanation is written.

[1] Appropriate work is shown, but one computational or graphing error is made. A correct explanation is written.

or

[1] Appropriate work is shown, but one conceptual error is made.

or

[1] $y = -\frac{3}{4}x + 5$ or an equivalent equation is written, but the explanation is incomplete or incorrect.

[0] The equation $3x + 4y = 20$ or an equivalent equation is written, but the explanation is missing.

or

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

Part III

For each question, use the specific criteria to award a maximum of 4 credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(32) **[4]** Triangles *ABC* and *DEF* are graphed and labeled correctly, a reflection over the correct line is stated, and a correct explanation is written.

[3] Appropriate work is shown, but one or more graphing or labeling errors are made. An appropriate line of reflection is stated, and an appropriate explanation is written.

or

[3] Appropriate work is shown, but the line of reflection is missing or incorrect. An appropriate explanation is written.

[2] Appropriate work is shown, but one or more graphing or labeling errors are made. An appropriate line of reflection is stated, but an incomplete or partially correct explanation is written.

or

[2] Appropriate work is shown to graph and label both triangles, and a correct line of reflection is stated. No further correct work is shown.

[1] Appropriate work is shown to graph and label both triangles, but no further correct work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

(33) **[4]** A complete and correct proof that includes a conclusion is written.

[3] A proof is written that demonstrates a thorough understanding of the method of proof and contains no conceptual errors, but one statement and/or reason is missing or incorrect.

[2] A proof is written that demonstrates a good understanding of the method of proof and contains no conceptual errors, but two statements and/or reasons are missing or incorrect.

or

[2] A proof is written that demonstrates a good understanding of the method of proof, but one conceptual error is made.

or

[2] A proof is written that shows $\triangle TXR \cong \triangle VXS$, but no further correct work is shown.

[1] Only one correct statement and reason are written.

[0] The "given" and/or the "prove" statements are written, but no further correct relevant statements are written.

or

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

(34) **[4]** 10.9, and correct work is shown.

[3] Appropriate work is shown, but one computational or rounding error is made.

or

[3] Correct work is shown to find the radius of the cylinder, but no further correct work is shown.

[2] Appropriate work is shown, but one conceptual error is made.

or

[2] Appropriate work is shown, but two or more computational or rounding errors are made.

[1] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.

or

[1] Appropriate work is shown to find the number of cubic feet in the tank, but no further correct work is shown.

or

[1] 10.9, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

Part IV

For each question, use the specific criteria to award a maximum of 6 credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(35) **[6]** A complete and correct proof that includes concluding statements that *PQRS* is a rhombus and *PQRS* is not a square is written.

[5] Appropriate work is shown, but one computational or graphing error is made. Appropriate concluding statements are written.

or

[5] Appropriate work is shown to prove *PQRS* is a rhombus, and work is shown to prove *PQRS* is not a square. One concluding statement is missing or incorrect.

[4] Appropriate work is shown, but two or more computational or graphing errors are made. Appropriate concluding statements are written.

or

[4] Appropriate work is shown, but one conceptual error is made. Appropriate concluding statements are written.

or

[4] Appropriate work is shown to prove *PQRS* is a rhombus and a concluding statement is written. No further correct work is shown.

[3] Appropriate work is shown, but one conceptual error and one computational or graphing error are made. Appropriate concluding statements are written.

or

[3] Appropriate work is shown to prove *PQRS* is a parallelogram and a concluding statement is written. No further correct work is shown.

[2] Appropriate work is shown, but two conceptual errors are made. Appropriate concluding statements are written.

or

[2] Appropriate work is shown, but one conceptual error and two or more computational or graphing errors are made. Appropriate concluding statements are written.

or

[2] Appropriate work is shown to prove two pairs of opposite sides are parallel. No further correct work is shown.

or

[2] Appropriate work is shown to find the lengths of all four sides. No further correct work is shown.

or

[2] Appropriate work is shown to prove the diagonals are perpendicular bisectors of each other. No further correct work is shown.

or

[2] Appropriate work is shown to prove *PQRS* is not a square and a concluding statement is written. No further correct work is shown.

[1] Appropriate work is shown, but two conceptual errors and one computational or graphing error are made. Appropriate concluding statements are written.

or

[1] Appropriate work is shown to find the slopes of all four sides. No further correct work is shown.

or

[1] Appropriate work is shown to find the slopes and lengths of one pair of opposite sides. No further correct work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

(36) **[6]** 18,442 and 210, and correct work is shown.

[5] Appropriate work is shown, but one computational or rounding error is made.

or

[5] Correct work is shown to find 18,442, and the speed of the airplane in miles per minute or feet per hour, but no further correct work is shown.

[4] Appropriate work is shown, but two computational or rounding errors are made.

or

[4] Appropriate work is shown, but one conceptual error is made.

or

[4] Correct work is shown to find the distance the airplane has traveled, 18,442, but no further correct work is shown.

[3] Appropriate work is shown, but three or more computational or rounding errors are made.

or

[3] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.

[2] Two correct trigonometric equations are written to determine how far the airplane has traveled, but no further correct work is shown.

or

[2] Appropriate work is shown, but one conceptual error and two or more computational or rounding errors are made.

or

[2] Appropriate work is shown, but two conceptual errors are made.

[1] Appropriate work is shown, but two conceptual errors and one computational or rounding error are made.

or

[1] 18,442 and 210, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

Map to the Common Core Learning Standards
Geometry (Common Core)
June 2017

Question	Type	Credits	Cluster
1	Multiple Choice	2	G-CO.B
2	Multiple Choice	2	G-GPE.B
3	Multiple Choice	2	G-SRT.C
4	Multiple Choice	2	G-C.A
5	Multiple Choice	2	G-SRT.B
6	Multiple Choice	2	G-SRT.A
7	Multiple Choice	2	G-CO.A
8	Multiple Choice	2	G-C.A
9	Multiple Choice	2	G-CO.C
10	Multiple Choice	2	G-SRT.B
11	Multiple Choice	2	G-CO.C
12	Multiple Choice	2	G-GPE.A
13	Multiple Choice	2	G-SRT.C
14	Multiple Choice	2	G-SRT.A
15	Multiple Choice	2	G-GPE.B
16	Multiple Choice	2	G-GMD.A
17	Multiple Choice	2	G-CO.C
18	Multiple Choice	2	G-GMD.B
19	Multiple Choice	2	G-GPE.B
20	Multiple Choice	2	G-CO.C
21	Multiple Choice	2	G-SRT.C
22	Multiple Choice	2	G-CO.B
23	Multiple Choice	2	G-MG.A
24	Multiple Choice	2	G-SRT.B
25	Constructed Response	2	G-CO.D
26	Constructed Response	2	G-C.B
27	Constructed Response	2	G-GMD.A
28	Constructed Response	2	G-MG.A
29	Constructed Response	2	G-SRT.B
30	Constructed Response	2	G-CO.A
31	Constructed Response	2	G-SRT.A
32	Constructed Response	4	G-CO.B
33	Constructed Response	4	G-CO.C
34	Constructed Response	4	G-MG.A
35	Constructed Response	6	G-GPE.B
36	Constructed Response	6	G-SRT.C

Regents Examination in Geometry (Common Core)

June 2017

Chart for Converting Total Test Raw Scores to Final Examination Scores (Scale Scores)

The *Chart for Determining the Final Examination Score for the June 2017 Regents Examination in Geometry (Common Core)* will be posted on the Department's web site at: http://www.p12.nysed.gov/assessment/ on Friday, June 16, 2017. Conversion charts provided for previous administrations of the Regents Examination in Geometry (Common Core) must NOT be used to determine students' final scores for this administration.

Online Submission of Teacher Evaluations of the Test to the Department

Suggestions and feedback from teachers provide an important contribution to the test development process. The Department provides an online evaluation form for State assessments. It contains spaces for teachers to respond to several specific questions and to make suggestions. Instructions for completing the evaluation form are as follows:

1. Go to http://www.forms2.nysed.gov/emsc/osa/exameval/reexameval.cfm.

2. Select the test title.

3. Complete the required demographic fields.

4. Complete each evaluation question and provide comments in the space provided.

5. Click the SUBMIT button at the bottom of the page to submit the completed form.