FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

GEOMETRY

Wednesday, August 17, 2011 – 8:30 to 11:30 a.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. More detailed information about scoring is provided in the publication *Information Booklet for Scoring the Regents Examinations in Mathematics*.

Do *not* attempt to correct the student's work by making insertions or changes of any kind. In rating the open-ended questions, you may make check marks in the exam booklet to indicate student errors. If the students were given scannable answer sheets for the multiple-choice questions, be careful not to make any stray marks on the answer sheet that might later interfere with the accuracy of the scanning.

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. On the back of the student's detachable answer sheet, raters must enter their initials in the boxes next to the questions they have scored and also write their name in the box under the heading "Rater's/Scorer's Name."

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 detachable 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/apda/ on Wednesday, August 17, 2011. 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 detachable answer sheet. The scale score is the student's final examination score.

Part I

Allow a total of 56 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) 4	(8) 2	(15) 1	(22) 2
(2) 2	(9) 3	(16) 1	(23) 3
(3) 3	(10) 4	(17) 2	(24) 4
(4) 3	(11) 3	(18) 3	(25) 2
(5) 4	(12) 2	(19) 4	(26) 1
(6) 4	(13) 1	(20) 2	(27) 3
(7) 3	(14) 4	(21) 1	(28) 3

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 http://www.p12.nysed.gov/apda/ 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.

General Rules for Applying Mathematics Rubrics

I. General Principles for Rating

The rubrics for the constructed-response questions on the Regents Examination in Geometry 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 Examinations in Mathematics*, 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 State 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 any response. 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. A response with one conceptual error can receive no more than half credit.

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.

If a response shows two (or more) different major conceptual errors, it should be considered completely incorrect and receive no credit.

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; i.e., awarding half credit for the conceptual error and deducting 1 credit for each mechanical error (maximum of two deductions for mechanical errors).

Part II

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

(29) **[2]** 50, and appropriate work is shown, such as a labeled diagram.

[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] $2x + 80 = 180$ or an equivalent equation is written, but no further correct work is shown.

or

[1] 50, 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.

(30) **[2]** A correct construction is drawn showing all appropriate arcs, and the perpendicular bisector is correctly drawn.

[1] A correct construction is drawn showing all appropriate arcs, but the perpendicular bisector of $\overline{AB}$ or $\overline{BC}$ is drawn.

or

[1] A correct construction is drawn showing all appropriate arcs, but the perpendicular bisector is not drawn.

[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.

(31) **[2]** 972π, and appropriate work is shown.

[1] Appropriate work is shown, but one computational error is made, but an appropriate answer is written in terms of π.

or

[1] Appropriate work is shown, but one conceptual error is made, but an appropriate answer is written in terms of π.

or

[1] Appropriate work is shown, but the answer is not written in terms of π.

or

[1] 972π, 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.

(32) **[2]** $(x - 5)^2 + (y + 4)^2 = 36$.

[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] Center of (5,–4) and radius of 6 are stated, 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) **[2]** A complete and correct proof that includes a conclusion is written.

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

or

[1] One conceptual error is made.

[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) **[2]** (7,5), and appropriate work is shown, such as locating the centroid on the vertical median or graphing at least two medians.

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

or

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

or

[1] One or two medians are graphed correctly and the median is located, but the coordinates are not stated or are stated incorrectly.

or

[1] (7,5), 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 III

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

(35) **[4]** The triangle is not isosceles, and an appropriate justification is given, such as a correctly labeled diagram.

[3] Appropriate work is shown, but one computational error is made, but an appropriate determination is made, and an appropriate justification is given.

[2] Appropriate work is shown, but two or more computational errors are made, but an appropriate determination is made, and an appropriate justification is given.

or

[2] Appropriate work is shown, but one conceptual error is made, but an appropriate determination is made, and an appropriate justification is given.

or

[2] The correct measures of $\angle JHK$ or $\angle JKH$ and $\angle GKH$ or $\angle GHK$ are found, but no determination is made.

[1] Appropriate work is shown, but one conceptual error and one computational error are made, but an appropriate determination is made, and an appropriate justification is given.

or

[1] Appropriate work is shown to find the correct measure of $\angle JHK$ or $\angle JKH$, but no further correct work is shown.

[0] Indicates the triangle is not isosceles, but no work 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.

(36) **[4]** $G''(3,3)$, $H''(7,7)$, and $S''(-1,9)$ are graphed, stated, and labeled correctly, and appropriate work is shown.

[3] Appropriate work is shown, but one computational, graphing, or labeling error is made, but appropriate coordinates are graphed, stated, and labeled.

or

[3] Appropriate work is shown to find $G''(3,3)$, $H''(7,7)$, and $S''(-1,9)$, but no graph is drawn.

or

[3] $\triangle G''H''S''$ is graphed and labeled correctly, but the coordinates are not stated or are stated incorrectly.

[2] Appropriate work is shown, but two or more computational, graphing, or labeling errors are made, but appropriate coordinates are graphed, stated, and labeled.

or

[2] Appropriate work is shown, but one conceptual error is made, such as performing the translation before the dilation, but appropriate coordinates are graphed, stated, and labeled.

or

[2] The dilation is performed correctly, the image is graphed and labeled correctly, and the coordinates are labeled and stated correctly, but no further correct work is shown.

[1] Appropriate work is shown, but one conceptual error and one computational, graphing, or labeling error are made, but appropriate coordinates are graphed, stated, and labeled.

or

[1] Appropriate work is shown to find (3,3), (7,7), and (–1,9), but the points are not labeled, and no graph is drawn.

or

[1] Appropriate work is shown to find $G'(6,2)$, $H'(10,6)$, and $S'(2,8)$, but no further correct work is shown.

or

[1] The dilation is graphed and labeled correctly, but no further correct work is shown.

or

[1] $G''(3,3)$, $H''(7,7)$, and $S''(-1,9)$, but no work is shown, and no graph is drawn.

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

(37) **[4]** 2, and appropriate algebraic work is shown.

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

or

[3] Appropriate work is shown, but the negative root is included in the solution.

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

or

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

or

[2] A correct quadratic equation in standard form (set equal to zero) is written, but no further correct work is shown.

or

[2] Work is shown to find 2, but a method other than algebraic is used.

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

or

[1] A correct proportion is written, but no further correct work is shown.

or

[1] 2, 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 this question, use the specific criteria to award a maximum of six credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(38) **[6]** Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, and an appropriate concluding statement is made.

[5] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but one computational or graphing error is made.

or

[5] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but the concluding statement is missing or is incorrect.

[4] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but two or more computational or graphing errors are made.

or

[4] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but one conceptual error is made.

[3] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but two or more computational or graphing errors are made, and the concluding statement is missing or is incorrect.

or

[3] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but one conceptual error and one computational or graphing error are made.

or

[3] Appropriate work is shown to prove *ADEF* is a parallelogram, but no further correct work is shown.

or

[3] Appropriate work is shown to prove *ADEF* is not a rhombus, but no further correct work is shown.

[2] Appropriate work is shown to prove *ADEF* is a parallelogram and not a rhombus, but two conceptual errors are made.

or

[2] Appropriate work is shown to prove $\overline{DE} \parallel \overline{AF}$ and $\overline{AD} \parallel \overline{FE}$, but no further correct work is shown.

or

[2] Appropriate work is shown to prove that $\overline{DF}$ and $\overline{AE}$ bisect each other, but no further correct work is shown.

or

[2] Appropriate work is shown to prove that $\overline{DF}$ is not perpendicular to $\overline{AE}$, but no further correct work is shown.

or

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

or

[2] Appropriate work is shown to prove one pair of opposite sides are both congruent and parallel, but no further correct work is shown.

[1] Appropriate work is shown to find the midpoints of $\overline{DF}$ and $\overline{AE}$, but no further correct work is shown.

or

[1] Appropriate work is shown to find all four slopes, but no further correct work is shown.

or

[1] Midpoints *D*, *E*, and *F* are found, 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.

Map to Core Curriculum

Content Band	Item Numbers
Geometric Relationships	16, 20, 23, 31
Constructions	6, 30
Locus	17, 34
Informal and Formal Proofs	1, 2, 3, 5, 9, 11, 14, 19, 21, 24, 25, 27, 28, 29, 33, 35, 37
Transformational Geometry	4, 8, 13, 36
Coordinate Geometry	7, 10, 12, 15, 18, 22, 26, 32, 38

Regents Examination in Geometry

August 2011

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

The *Chart for Determining the Final Examination Score for the August 2011 Regents Examination in Geometry* will be posted on the Department's web site at: http://www.p12.nysed.gov/apda/ on Wednesday, August 17, 2011. Conversion charts provided for previous administrations of the Geometry examination 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.