

# FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

## GEOMETRY

Tuesday, June 16, 2009 — 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. More detailed information about scoring is provided in the publication *Information Booklet for Scoring the Regents Examination in Geometry*.

Use only a No. 2 pencil in rating the Regents Examination in Geometry. Do *not* attempt to correct the student's work by making insertions or changes of any kind. Scoring overlays have been included in the package of scoring materials and must be used to score Part I, the multiple-choice section. When scoring the examination:

- **cut out** the rectangular space on the bottom of the scoring overlay to record the total Part I score
- **do not** punch holes in the scoring overlay
- **do not** make any marks on the answer sheet, other than in the spaces provided for recording scores
- **do not** machine scan the answer sheets. Marking up or scanning these answer sheets will interfere with the score collection.

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. On the back of the student's 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."

Raters should record the student's scores for all questions and the total raw score on the student's answer sheet. Make a careful record to be retained in the school of the total raw score earned by each student. The State Education Department will provide a recordkeeping form for this purpose as part of the detailed directions for administering and scoring the June 2009 Regents Examination in Geometry.

The conversion chart for the Regents Examination in Geometry will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> no later than Rating Day, Thursday, June 25, 2009.

GEOMETRY – *continued*

**Part I**

Allow a total of 56 credits, 2 credits for each of the following:

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

Updated information regarding the rating of this examination may be posted on the New York State Education Department’s website during the rating period. Check this web site <http://www.emsc.nysed.gov/osa/> and select the link “Examination 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 Examination in Geometry*, use their own professional judgment, confer with other mathematics teachers, and/or contact the consultants at 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, 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] 20, 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] 20, 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 line is drawn.

[1] Appropriate work is shown, but one construction error is made, such as not drawing the perpendicular line.

*or*

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

[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.

GEOMETRY – *continued*

(31) [2]  $y - 4 = -2(x - 5)$  or an equivalent equation, 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, such as leaving the answer as  $\frac{y - 4}{x - 5} = \frac{-2}{1}$ , which has a domain restriction.

*or*

[1]  $y - 4 = -2(x - 5)$  or an equivalent equation, 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] Both loci are sketched correctly, and the two points of intersection are labeled with an X.

[1] Both loci are sketched correctly, but the points of intersection are not labeled or are labeled incorrectly.

*or*

[1] Appropriate work is shown, but one conceptual error is made, but appropriate points of intersection are labeled.

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

GEOMETRY – *continued*

(33) [2] True, and an appropriate justification is written.

[1] True, but the justification is incorrect.

*or*

[1] One conceptual error is made in evaluating the disjunction, but an appropriate justification is written.

[0] True, but no justification is 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] 20, 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] 20, 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.

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**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] 18, and appropriate work is shown, such as  $3x + x = 24$ .

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

*or*

[3]  $x = 6$ , and appropriate work is shown, but  $\overline{SE}$  is not found or is found incorrectly.

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

*or*

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

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

*or*

[1] 18, 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.

GEOMETRY – *continued*

(36) [4]  $15 + 5\sqrt{5}$ , and appropriate work is shown.

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

*or*

[3] Appropriate work is shown, but the perimeter is not expressed in simplest radical form.

*or*

[3] Appropriate work is shown to find the length of all three sides, but the perimeter is not found.

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

*or*

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

*or*

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

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

*or*

[1] Appropriate work is shown to find the length of one side, but no further correct work is shown.

*or*

[1]  $15 + 5\sqrt{5}$ , 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.

GEOMETRY – *continued*

(37) [4]  $A''(0,-1)$ ,  $B''(-5,2)$ ,  $C''(-6,-1)$ , and  $D''(-1,-4)$ , and appropriate work is shown.

[3] The composite transformation is graphed and labeled correctly, but the coordinates are not stated or are stated incorrectly.

*or*

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

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

*or*

[2] Appropriate work is shown, but one conceptual error is made, such as performing the reflection before the translation.

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

*or*

[1]  $A''(0,-1)$ ,  $B''(-5,2)$ ,  $C''(-6,-1)$ , and  $D''(-1,-4)$ , 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.

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**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] A complete and correct proof that includes a concluding statement is written.

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

*or*

[5]  $\angle A \cong \angle E$  or  $\angle B \cong \angle D$  is proven, but no further correct work is shown.

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

*or*

[4]  $\triangle ABC \cong \triangle EDC$  is proven, but no further correct work is shown.

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

[2] Some correct relevant statements about the proof are made, but three or four statements or reasons are missing or incorrect.

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

[0] The given and/or the prove statements are rewritten in the style of a formal proof, 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.

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### Map to Core Curriculum

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

### Regents Examination in Geometry

June 2009

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

***The Chart for Determining the Final Examination Score for the June 2009 Regents Examination in Geometry will be posted on the Department’s web site <http://www.emsc.nysed.gov/osa/> on Thursday, June 25, 2009.***

### 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 [www.emsc.nysed.gov/osa/exameval](http://www.emsc.nysed.gov/osa/exameval).
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.

