

# FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

## INTEGRATED ALGEBRA

Thursday, January 28, 2010 — 1:15 to 4:15 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 Integrated Algebra. More detailed information about scoring is provided in the publication *Information Booklet for Scoring the Regents Examinations in Integrated Algebra and Geometry*.

Use only *red* ink or *red* pencil in rating Regents papers. Do *not* attempt to correct the student's work by making insertions or changes of any kind. 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. 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."

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 <http://www.emsc.nysed.gov/osa/> on Thursday, January 28, 2010. 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 60 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) 1	(9) 2	(17) 3	(25) 4
(2) 2	(10) 1	(18) 4	(26) 1
(3) 1	(11) 3	(19) 2	(27) 2
(4) 1	(12) 2	(20) 4	(28) 4
(5) 2	(13) 3	(21) 1	(29) 4
(6) 2	(14) 3	(22) 2	(30) 3
(7) 4	(15) 2	(23) 2	
(8) 3	(16) 4	(24) 4	

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.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 Examinations in Integrated Algebra 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 Integrated Algebra and Geometry*, 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, 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.

(31) [2] 16, 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] 16, 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] 53, and appropriate 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, such as using an incorrect trigonometric function.

*or*

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

*or*

[1] 53, 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.

INTEGRATED ALGEBRA – *continued*

(33) [2] Orchestra, and appropriate work is shown as justification.

[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 not dividing by the total number of tickets available.

*or*

[1] Appropriate work is shown, but orchestra is not stated.

[0] Orchestra, 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.

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**Part III**

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

(34) [3] –2 and 3, and appropriate algebraic work is shown.

[2] Appropriate work is shown, but one computational or factoring error is made, but two appropriate solutions are stated.

*or*

[2] Appropriate work is shown to find  $(x - 3)(x + 2) = 0$ , but no further correct work is shown.

[1] Appropriate work is shown, but two or more computational or factoring errors are made, but two appropriate solutions are stated.

*or*

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

*or*

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

*or*

[1] –2 and 3, but a method other than algebraic is used.

*or*

[1] –2 and 3, but no work is shown.

[0] –2 or 3, 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.

INTEGRATED ALGEBRA – *continued*

(35) [3] Mean = 81.3, median = 80, and appropriate work is shown, and an appropriate description is given, such as that both the mean and median will increase or that the mean becomes 86.3 and the median becomes 85.

[2] Appropriate work is shown, but one computational or rounding error is made, but an appropriate description is given.

*or*

[2] Mean = 81.3, median = 80, and appropriate work is shown, but the description is missing or is incorrect.

*or*

[2] Mean = 81.3 and median = 80, but no work is shown, but an appropriate description is given.

[1] Appropriate work is shown, but two or more computational or rounding errors are made, but an appropriate description is given.

*or*

[1] Appropriate work is shown, but one conceptual error is made, but an appropriate description is given.

*or*

[1] Mean = 81.3 and median = 80, but no work is shown, and no description is given.

[0] Mean = 81.3 or median = 80, but no work is shown, and no description is given.

*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) [3] 0.102, and appropriate work is shown.

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

*or*

[2]  $\frac{178.186 - 160}{178.186}$  or an equivalent expression, but the relative error is not found or is found incorrectly.

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

*or*

[1] Appropriate work is shown, but one conceptual error is made, such as dividing by 160.

*or*

[1] Appropriate work is shown to find 160 and 178.186, but no further correct work is shown.

*or*

[1] 0.102, 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 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.

(37) [4] 15,600,000 and 4,368,000, and appropriate work is shown.

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

*or*

[3] Appropriate work is shown to find 15,600,000 and 11,232,000, but the values are not subtracted.

[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] Appropriate work is shown to find 15,600,000 or 11,232,000, but no further correct work is shown.

*or*

[1]  $10 \cdot 10 \cdot 10 \cdot 26 \cdot 25 \cdot 24$  and  $10 \cdot 9 \cdot 8 \cdot 26 \cdot 25 \cdot 24$ , but no further correct work is shown.

*or*

[1] 15,600,000 and 4,368,000, but no work is shown.

[0] 15,600,000 or 4,368,000, 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.

INTEGRATED ALGEBRA – *continued*

(38) [4] The inequality is graphed correctly, and “yes” and an appropriate justification is given, such as plotting the point or checking algebraically.

[3] Appropriate work is shown, but one graphing error is made, such as drawing a solid line or shading incorrectly, but an appropriate answer and justification are given.

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

*or*

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

*or*

[2] The inequality is graphed correctly, but no further correct work is shown.

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

*or*

[1] The line  $4x - 3y = 9$  is graphed correctly, but no further correct work is shown.

*or*

[1] Algebraic work is shown determining that  $(1, -3)$  is in the solution set, but no graph is shown.

[0] “Yes,” 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.

(39) [4] 6, 8, and 10, 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 only one correct positive integer is found.

[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, such as finding consecutive integers.

*or*

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

*or*

[2] 6, 8, and 10, 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] An appropriate equation is written, but no further correct work is shown.

*or*

[1] 6, 8, and 10, but no work is shown.

[0] 6 or 8 or 10, 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.

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### Map to Core Curriculum

Content Strand	Item Numbers
Number Sense and Operations	10, 24, 37
Algebra	3, 4, 5, 6, 7, 8, 9, 11, 13, 16, 20, 21, 22, 23, 25, 26, 27, 28, 32, 34, 39
Geometry	12, 15, 17, 18, 29, 38
Measurement	31, 36
Statistics and Probability	1, 2, 14, 19, 30, 33, 35

### Regents Examination in Integrated Algebra

January 2010

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

**The *Chart for Determining the Final Examination Score for the January 2010 Regents Examination in Integrated Algebra* will be posted on the Department’s web site <http://www.emsc.nysed.gov/osa/> on Thursday, January 28, 2010. Conversion charts provided for previous administrations of the Integrated Algebra examination must NOT be used to determine students’ final scores for this administration.**

### Submitting 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.