# FOR TEACHERS ONLY

**The University of the State of New York**

**REGENTS HIGH SCHOOL EXAMINATION**

# INTEGRATED ALGEBRA

**Thursday,** August 16, 2012 — 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 Integrated Algebra. 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 scoring the open-ended questions, use check marks to indicate student errors. 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 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 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/apda/ on Thursday, August 16, 2012. 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.

## Part I

Allow a total of 60 credits, 2 credits for each of the following.

| | | |
|---|---|---|
| 1 . . . . . 3 . . . . . | 11 . . . . . 3 . . . . . | 21 . . . . . 3 . . . . . |
| 2 . . . . . 3 . . . . . | 12 . . . . . 2 . . . . . | 22 . . . . . 4 . . . . . |
| 3 . . . . . 3 . . . . . | 13 . . . . . 3 . . . . . | 23 . . . . . 2 . . . . . |
| 4 . . . . . 1 . . . . . | 14 . . . . . 4 . . . . . | 24 . . . . . 4 . . . . . |
| 5 . . . . . 2 . . . . . | 15 . . . . . 2 . . . . . | 25 . . . . . 3 . . . . . |
| 6 . . . . . 4 . . . . . | 16 . . . . . 4 . . . . . | 26 . . . . . 3 . . . . . |
| 7 . . . . . 3 . . . . . | 17 . . . . . 4 . . . . . | 27 . . . . . 2 . . . . . |
| 8 . . . . . 3 . . . . . | 18 . . . . . 2 . . . . . | 28 . . . . . 1 . . . . . |
| 9 . . . . . 1 . . . . . | 19 . . . . . 3 . . . . . | 29 . . . . . 4 . . . . . |
| 10 . . . . . 4 . . . . . | 20 . . . . . 1 . . . . . | 30 . . . . . 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 at: 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 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 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 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 2 credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(31) **[2]** $6.56 \times 10^{-2}$.

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

***or***

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

**[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]** $\frac{2(x+5)}{x+4}$ or $\frac{2x+10}{x+4}$, and appropriate work is shown.

**[1]** Appropriate work is shown, but one computational or factoring error is made, but an appropriate fraction is stated.

***or***

**[1]** Appropriate work is shown, but one conceptual error is made, but an appropriate fraction is stated.

***or***

**[1]** The expression is factored correctly, but no further correct work is shown.

***or***

**[1]** $\frac{2(x+5)}{x+4}$ or $\frac{2x+10}{x+4}$, 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.

(33) **[2]** A correct graph is drawn over the given interval.

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

***or***

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

**[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 3 credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(34) **[3]** All three answers (3, 0, and 20) are correct.

**[2]** Only two answers are correct.

**[1]** One conceptual error is made, such as interpreting the graph as a frequency histogram.

***or***

**[1]** Only one answer is correct.

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

(35) **[3]** 0.129, and appropriate work is shown.

**[2]** Appropriate work is shown to find $\frac{103.309 - 90}{103.309}$ or an equivalent expression, but no further correct work is shown.

***or***

**[2]** Appropriate work is shown, but one computational or rounding error is made, but an appropriate relative error is found.

**[1]** Appropriate work is shown, but two or more computational or rounding errors are made, but an appropriate relative error is found.

***or***

**[1]** Appropriate work is shown, but one conceptual error is made, such as dividing by 90.

***or***

**[1]** Appropriate work is shown to find 90 and 103.309, but no further correct work is shown.

***or***

**[1]** 0.129, 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.

(36) **[3]** $x = -3$, $y = -5$ and $x = 3$, $y = 7$ or $(-3,-5)$ and $(3,7)$, and appropriate algebraic work is shown.

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

***or***

**[2]** Appropriate work is shown, but only $(-3,-5)$ or $(3,7)$ is found.

***or***

**[2]** Appropriate work is shown to find $x = -3$ and $x = 3$, but no further correct work is shown.

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

***or***

**[1]** Appropriate work is shown, but one conceptual error is made, but appropriate solutions are found.

***or***

**[1]** $x = -3$, $y = -5$ and $x = 3$, $y = 7$ or $(-3,-5)$ and $(3,7)$, but a method other than algebraic is used.

***or***

**[1]** $x^2 - 9 = 0$ or $x^2 = 9$ is written, but no further correct work is shown.

***or***

**[1]** $x = -3$, $y = -5$ and $x = 3$, $y = 7$ or $(-3,-5)$ and $(3,7)$, 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 4 credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(37) **[4]** A correct tree diagram or sample space is shown, and 1 and 2 are stated.

**[3]** Appropriate work is shown, but one computational error is made, but two appropriate numbers of outcomes are stated.

***or***

**[3]** A correct tree diagram or sample space is shown, but only 1 or 2 is stated.

***or***

**[3]** A correct tree diagram or sample space is shown, but the appropriate numbers of outcomes are stated as probabilities.

**[2]** Appropriate work is shown, but two or more computational errors are made, but two appropriate numbers of outcomes are stated.

***or***

**[2]** Appropriate work is shown, but one conceptual error is made, but two appropriate numbers of outcomes are stated.

***or***

**[2]** A correct tree diagram or sample space is shown, but no further correct work is shown.

***or***

**[2]** An incomplete tree diagram or sample space that shows an understanding of the problem is written, but two appropriate numbers of outcomes are stated.

**[1]** Appropriate work is shown, but one conceptual error and one computational error are made, but two appropriate numbers of outcomes are stated.

***or***

**[1]** An incorrect tree diagram or sample space that shows an understanding of the problem is written, but only one appropriate number of outcomes is stated.

***or***

**[1]** 1 and 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.

(38) **[4]** 54 and 23, and appropriate work is shown.

**[3]** Appropriate work is shown, but one computational or rounding error is made, but appropriate solutions are found.

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

***or***

**[2]** Appropriate work is shown, but one conceptual error is made, but appropriate solutions are found.

***or***

**[2]** Appropriate work is shown to find 54 or 23, but no further correct work is shown.

***or***

**[2]** $\text{Cos } x = \frac{17}{\mathbf{29}}$ and $17^2 + BC^2 = 29^2$ are written, but no further correct work is shown.*

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

***or***

**[1]** $\text{Cos } x = \frac{17}{\mathbf{29}}$ or $17^2 + BC^2 = 29^2$ is written, but no further correct work is shown.*

***or***

**[1]** 54 and 23, 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.

*Corrected – 8/17/12

(39) **[4]** Both inequalities are graphed and shaded correctly, and at least one is labeled, and the coordinates of a point that satisfies $y + x \geq 3$, but not $5x - 2y > 10$ are stated.

**[3]** Appropriate work is shown, but one graphing error is made, such as drawing a solid line for $5x - 2y > 10$ or shading incorrectly, but appropriate coordinates are stated.

***or***

**[3]** Both inequalities are graphed and shaded correctly, but neither graph is labeled, but appropriate coordinates are stated.

***or***

**[3]** Both inequalities are graphed and shaded correctly, and at least one is labeled, but coordinates of a point are not stated or are stated incorrectly.

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

***or***

**[2]** Both inequalities are graphed and shaded correctly, but neither is labeled, and the coordinates of a point are not stated or are stated incorrectly.

***or***

**[2]** Appropriate work is shown, but one conceptual error is made, such as graphing the lines $y + x = 3$ and $5x - 2y = 10$ and stating the coordinates of a point on $y + x = 3$ but not on $5x - 2y = 10$.

***or***

**[2]** One of the inequalities is graphed, shaded, and labeled correctly, but no further correct work is shown.

**[1]** Appropriate work is shown, but two or more graphing or labeling errors are made and appropriate coordinates are not stated, or are stated incorrectly.

***or***

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

***or***

**[1]** Only the lines $y + x = 3$ and $5x - 2y = 10$ are graphed, and at least one is labeled.

***or***

**[1]** A point that satisfies $y + x \geq 3$, but not $5x - 2y > 10$ is identified and shown to be correct by checking in both inequalities, but no graphs are drawn.

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

## Regents Examination in Integrated Algebra

## August 2012

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

**The *Chart for Determining the Final Examination Score for the August 2012 Regents Examination in Integrated Algebra* will be posted on the Department's web site at: http://www.p12.nysed.gov/apda/ on Thursday, August 16, 2012. Conversion charts provided for previous administrations of the Regents Examination in Integrated Algebra 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.