

FOR TEACHERS ONLY

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

MATHEMATICS A

Tuesday, August 17, 2004 — 8:30 to 11:30 a.m., only

SCORING KEY

Mechanics of Rating

The following procedures are to be followed for scoring student answer papers for the Mathematics A examination. More detailed information about scoring is provided in the publication *Information Booklet for Administering and Scoring the Regents Examinations in Mathematics A and Mathematics B*.

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 checkmarks 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 scaled score by using the conversion chart that will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Tuesday, August 17, 2004. The student's scaled score should be entered in the box provided on the student's detachable answer sheet. The scaled 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) 4	(6) 3	(11) 4	(16) 2	(21) 1	(26) 4
(2) 3	(7) 2	(12) 4	(17) 4	(22) 1	(27) 3
(3) 1	(8) 3	(13) 2	(18) 1	(23) 3	(28) 2
(4) 4	(9) 1	(14) 1	(19) 3	(24) 3	(29) 1
(5) 2	(10) 2	(15) 1	(20) 2	(25) 2	(30) 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. Visit the site <http://www.emsc.nysed.gov/osa/> and select the link “Latest Information” for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and at least one more time before the final scores for the examination are recorded.

General Rules for Applying Mathematics Rubrics

I. General Principles for Rating

The rubrics for the constructed-response questions on the Regents Examinations in Mathematics A and Mathematics B 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 Administering and Scoring Examinations in Mathematics A and Mathematics B*, 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.

(31) [2] 75, and appropriate work is shown.

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

or

[1] An incorrect equation of equal difficulty, such as $x + 5x = 180$, is solved appropriately, and an appropriate angle measure is found.

or

[1] A correct equation is written and solved for x , but no further correct work is shown.

or

[1] 75, 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] $\sqrt{196}$, and an appropriate explanation is given.

[1] An incorrect answer is chosen, but an appropriate explanation is given.

or

[1] $\sqrt{196}$, but no explanation or an incorrect explanation is given.

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

MATHEMATICS A – *continued*

(33) [2] An isosceles triangle that is not acute is drawn, and its three angles are labeled, such as 20, 20, 140 or 45, 45, 90.

[1] An isosceles triangle is drawn that shows an angle that is not acute, but the base angles are not labeled.

or

[1] The three angles are stated correctly, but no triangle is drawn.

[0] The triangle that is drawn and labeled is not isosceles or is acute.

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] $3a(x - 3)(x + 3)$, and appropriate work is shown.

[1] Appropriate work is shown, but one factoring error is made, or the expression is not factored completely.

or

[1] $3a(x - 3)(x + 3)$, 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.

(35) [2] 50, and appropriate work is shown, such as using a proportion.

[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] An incorrect fractional part is determined, but an appropriate number of students is found.

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.

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.

- (36) [3] \$800, and appropriate work is shown, such as $0.15x + 50 = 170$ or a table of values or trial and error with at least three trials and appropriate checks.
- [2] Appropriate work is shown, but one computational error is made.
- or***
- [2] The trial-and-error method is used to find the correct solution, but only two trials and appropriate checks are shown.
- [1] Appropriate work is shown, but two or more computational errors are made.
- or***
- [1] Appropriate work is shown, but one conceptual error is made.
- or***
- [1] Appropriate work is shown, but the \$50 per day is not included in his pay, resulting in an answer of \$1,133.33.
- or***
- [1] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but no solution is found.
- or***
- [1] \$800, but no work or only one trial with an appropriate check 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.

MATHEMATICS A – *continued*

- (37) [3] The frequency table is completed correctly, showing frequencies of 6, 2, 4, 5, and 3, and a frequency histogram is drawn and labeled correctly.
- [2] The frequency table is completed correctly, but one graphing error is made, such as not labeling the axes, having nonequal intervals, or starting the x -axis at 50.
- or*
- [2] The frequency table is completed incorrectly, but an appropriate frequency histogram is drawn.
- or*
- [2] The frequency histogram is drawn and labeled correctly, but the frequency table is not completed.
- [1] The frequency table is completed correctly, but two or more graphing errors are made.
- or*
- [1] The frequency table is completed correctly, but no frequency histogram is drawn or a bar 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.
-

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.

- (38) [4] 145, and appropriate work is shown, such as $\left(\frac{1}{2}\pi 13^2\right) - \left(\frac{1}{2} \cdot 10 \cdot 24\right)$.
- [3] Appropriate work is shown, but one computational or rounding error is made or the answer is expressed in terms of π .
- or**
- [3] Appropriate work is shown, but the area of the entire circle is used to calculate the area of the shaded region.
- or**
- [3] The areas of the semicircle and triangle are found correctly, but they are not subtracted to find the shaded area.
- [2] Appropriate work is shown, but two or more computational or rounding errors are made.
- or**
- [2] An incorrect formula is used to find the area of the triangle or the semicircle, but an appropriate shaded area is found.
- or**
- [2] Only the area of the semicircle or the area of the triangle is found correctly, and no further correct work is shown.
- [1] Both the areas of the semicircle and the triangle are found incorrectly, but they are subtracted to find an appropriate shaded area.
- or**
- [1] Only the length of \overline{AC} is found correctly.
- or**
- [1] 145, 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.

MATHEMATICS A – *continued*

(39) [4] 3 and -5 , and appropriate work is shown, such as $x(x + 7) = 5(x + 3)$ or trial and error with at least three trials and appropriate checks for each solution.

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

or

[3] Appropriate work is shown, but only one correct solution is found.

or

[3] The trial-and-error method is used to find both correct solutions, but only two trials and appropriate checks are shown for each solution.

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

or

[2] A correct quadratic equation is written and factored, but no further correct work is shown.

or

[2] The trial-and-error method is attempted and at least six systematic trials and appropriate checks are shown, but neither solution is found.

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

or

[1] 3 and -5 , but no work or only one trial with an appropriate check is shown.

[0] 3 *or* -5 , but no work or only one trial with an appropriate check 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.

Map to Learning Standards

Key Ideas	Item Numbers
Mathematical Reasoning	16, 19, 27
Number and Numeration	13, 22, 32
Operations	1, 5, 8, 9, 18, 23, 24, 34
Modeling/Multiple Representation	3, 7, 11, 21, 25, 26, 28, 31, 33
Measurement	2, 12, 14, 15, 35, 37, 38
Uncertainty	4, 30
Patterns/Functions	6, 10, 17, 20, 29, 36, 39

Regents Examination in Mathematics A

August 2004

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

The Chart for Determining the Final Examination Score for the August 2004 Regents Examination in Mathematics A, normally located on this page, will be posted on the Department’s web site <http://www.emsc.nysed.gov/osa/> on Tuesday, August 17, 2004. Conversion charts provided for previous administrations of the Mathematics A examination must NOT be used to determine students’ final scores for this administration.

