

# FOR TEACHERS ONLY

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

## MATHEMATICS A

Monday, January 27, 2003 — 1:15 to 4:15 p.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 printed at the end of this key. 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 40 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) 3	(6) 3	(11) 3	(16) 1
(2) 2	(7) 3	(12) 2	(17) 1
(3) 4	(8) 1	(13) 2	(18) 3
(4) 3	(9) 4	(14) 4	(19) 4
(5) 1	(10) 1	(15) 2	(20) 2

**Part II**

For each question, use the specific criteria to award a maximum of two credits.

- (21) [2] 6, and a correct tree diagram is drawn or sample space is listed.
- [1] A correct tree diagram is drawn or sample space is listed, but no answer or an incorrect answer is found.
- or***
- [1] An appropriate answer is found, based on an incorrect tree diagram or sample space.
- or***
- [1] 6, but no tree diagram is drawn or sample space is listed.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- (22) [2] 42.85714286 or an equivalent answer, and appropriate work is shown.
- [1] Appropriate work is shown, but one computational or rounding error is made.
- or***
- [1] An answer of 30 is found by dividing 1.8 by 6.
- or***
- [1] An answer of 70 is found by dividing 4.2 by 6.
- or***
- [1] 42.85714286 or an equivalent answer, 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.
- (23) [2] 120, and appropriate work is shown, such as  $1 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$ .
- [1] Appropriate work is shown, but one computational error is made.
- or***
- [1] 720 and  ${}_6P_6$  or  $6!$  is shown.
- or***
- [1] 120, 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*

(24) [2] 20, and appropriate work is shown, such as  $3,360 \div (14 \times 12)$ .

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

(25) [2] 2, and appropriate work is shown.

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

*or*

[1] Appropriate work is shown to find the number of students for any flavor other than coffee.

*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.

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**Part III**

For each question, use the specific criteria to award a maximum of three credits.

- (26) [3] 4, 6, and 8, and appropriate work is shown, such as the correct quadratic equation or trial and error with at least three trials and appropriate checks.
- [2] The correct quadratic equation is solved, but one computational error is made, but three appropriate ages are listed.
- or***
- [2] The correct quadratic equation is solved, but the negative root is not rejected, but three appropriate ages are listed.
- or***
- [2] The correct quadratic equation is solved, but only one age is found.
- or***
- [2] The trial-and-error method is used to find a correct solution, but only two trials and appropriate checks are shown.
- [1] An incorrect equation of lesser difficulty is solved appropriately, and the three ages are listed.
- or***
- [1] An incorrect quadratic equation of equal difficulty is solved appropriately, and the three ages are listed.
- or***
- [1] The correct quadratic equation is shown, but more than one computational error is made.
- or***
- [1] The correct quadratic equation is shown, but no further correct work is shown.
- or***
- [1] 4, 6, and 8, 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.

- (27) [3] 374 grasshoppers and 187 crickets, and appropriate work is shown.
- [2] An appropriate equation is solved or appropriate work is shown, but only one correct answer is found, or two correct answers are found but they are not identified clearly as grasshoppers or crickets, or the grasshoppers and crickets are labeled incorrectly.
- or***
- [2] Appropriate work is shown, but one computational error is made.
- [1] Appropriate work is shown, but more than one computational error is made.
- or***
- [1] An incorrect equation of equal difficulty is solved appropriately.
- or***
- [1] 374 grasshoppers and 187 crickets, but no work is shown.
- [0] 374 and 187, but no work is shown, and the answers are not identified clearly as grasshoppers or crickets.
- or***
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
- (28) [3]  $y = x^2 + 3x - 18$ , and appropriate work leading from the roots to the equation is shown.
- [2] Appropriate work is shown, but one computational error is made.
- or***
- [2]  $x^2 + 3x - 18 = 0$ , but appropriate work is shown.
- or***
- [2] Only the correct factors  $(x + 6)$  and  $(x - 3)$  are shown.
- [1] Appropriate work is shown, but more than one computational error is made.
- or***
- [1] Only the roots  $-6$  and  $3$  are shown, such as  $x = -6$ ,  $x = 3$ .
- or***
- [1]  $y = x^2 + 3x - 18$ , 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.

MATHEMATICS A – *continued*

(29) [3] 5, and appropriate work is shown, such as the equation  $60 + 5x = 135 - 10x$ , or trial and error with at least three trials and appropriate checks, or a graph.

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

**or**

[2] The trial-and-error method is used to find a correct solution, but only two trials and appropriate checks are shown.

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

**or**

[1] 5, 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.

(30) [3] 162, and appropriate work is shown.

[2] The Pythagorean theorem is used correctly to find the hypotenuse, but the result is not multiplied by 6.

**or**

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

[1] Appropriate work is shown, but more than one computational or rounding error is made.

**or**

[1] 162, 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.

(31) [4] \$68,000, and appropriate work is shown.

[3] \$119,000 and \$51,000, and appropriate work is shown, but the answers are not subtracted to find the difference.

*or*

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

[2] Appropriate work is shown, but more than one computational error is made.

[1] The value for one share (\$17,000) is found, but no further correct work is shown.

*or*

[1] \$68,000, but no work is shown.

[0] \$17,000 or \$119,000 or \$51,000, and 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.

MATHEMATICS A – *continued*

(32) [4] One doughnut is \$0.75 and one cookie is \$0.60, and appropriate work is shown, such as a system of equations, trial and error with at least three trials and appropriate checks, or a table.

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

*or*

[3] Appropriate work is shown, but only one correct answer is found, or two correct answers are found, but they are not identified clearly as doughnuts or cookies, or the doughnuts and cookies are labeled incorrectly.

[2] Appropriate work is shown, but more than one computational error is made.

*or*

[2] Two equations are written, one correct and one incorrect, but two appropriate answers are found.

*or*

[2] The trial-and-error method is used to find a correct solution, but only two trials and appropriate checks are shown.

[1] Two correct equations are written, but no further correct work is shown.

*or*

[1] One doughnut is \$0.75 and one cookie is \$0.60, but no work or only one trial with an appropriate check is shown.

[0] One correct equation is shown, and no answer or only one appropriate answer is found.

*or*

[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) [4] Quadrilaterals  $ABCD$  and  $A'B'C'D'$  are drawn and labeled correctly and 24 is found as the area, and appropriate work is shown.

[3] One graphing error is made in the transformation, but an appropriate area of  $A'B'C'D'$  is found.

**or**

[3] Correct quadrilaterals are drawn and labeled, but one computational error is made in determining the area.

**or**

[3] Quadrilaterals  $ABCD$  and  $A'B'C'D'$  are drawn correctly and 24 is found as the area, but the vertices are not labeled.

[2] Correct quadrilaterals are drawn and labeled, but no further correct work is shown.

**or**

[2] One conceptual error is made, such as reflecting in the  $x$ -axis, but the correct area is found.

[1] 24, 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.

(34) *a* [3] The frequency table is completed correctly, and a histogram is drawn with a correct scale and is labeled correctly.

[2] One or two errors are made in the frequency table, but an appropriate histogram is drawn.

**or**

[2] The frequency table is completed correctly, but one error is made in drawing the histogram.

[1] A correct histogram is drawn, but the frequency table is not completed.

*b* [1] The interval 91–100 is identified as containing the 75th percentile.

**or**

[1] The appropriate interval is identified, based on an incorrect frequency table in part *a*.

*a* and *b*

[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 – *concluded*

(35) [4] All lines are graphed and labeled correctly and area = 10, and appropriate work is shown.

[3] The lines are graphed and labeled correctly, but the area of the triangle is missing or is incorrect.

**or**

[3] One of the lines is graphed incorrectly, but the area for the given triangle is found appropriately.

[2] One of the lines is graphed incorrectly, and the area of the triangle is missing or is incorrect.

[1] Only one line is graphed and labeled correctly, and no further correct work is shown.

**or**

[1] All three lines are graphed incorrectly, but the area for the given triangle is found appropriately.

**or**

[1] Area = 10, 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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MATHEMATICS A

**Map to Learning Standards**

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

## Regents Examination in Mathematics A

January 2003

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

Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score
85	100	56	69	27	35
84	99	55	68	26	34
83	98	54	67	25	33
82	97	53	66	24	32
81	96	52	65	23	30
80	95	51	64	22	29
79	94	50	63	21	28
78	93	49	61	20	27
77	92	48	60	19	25
76	91	47	59	18	24
75	90	46	58	17	23
74	89	45	57	16	22
73	88	44	56	15	20
72	87	43	55	14	19
71	86	42	53	13	18
70	84	41	52	12	16
69	83	40	51	11	15
68	82	39	50	10	14
67	81	38	49	9	12
66	80	37	48	8	11
65	79	36	46	7	10
64	78	35	45	6	8
63	77	34	44	5	7
62	76	33	43	4	6
61	75	32	42	3	4
60	74	31	40	2	3
59	73	30	39	1	1
58	72	29	38	0	0
57	70	28	37		

To determine the student's final examination score, find the student's total test raw score in the column labeled "Raw Score" and then locate the scaled score that corresponds to that raw score. The scaled score is the student's final examination score. Enter this score in the space labeled "Scaled Score" on the student's answer sheet.

All student answer papers that receive a scaled score of 60 through 64 **must** be scored a second time. For the second scoring, a different committee of teachers may score the student's paper or the original committee may score the paper, except that no teacher may score the same open-ended questions that he/she scored in the first rating of the paper. The school principal is responsible for assuring that the student's final examination score is based on a fair, accurate, and reliable scoring of the student's answer paper.

Because scaled scores corresponding to raw scores in the conversion chart may change from one examination to another, it is crucial that for each administration, the conversion chart provided in the scoring key for that administration be used to determine the student's final score. The chart above is usable only for this administration of the mathematics A examination.