FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS A

Thursday, August 16, 2001 — 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 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) 2	(6) 2	(11) 4	(16) 3
(2) 4	(7) 4	(12) 1	(17) 1
(3) 2	(8) 3	(13) 4	(18) 1
(4) 3	(9) 4	(14) 2	(19) 2
(5) 1	(10) 3	(15) 1	(20) 4

Part II

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

(21) **[2]** 29, and appropriate work is shown, such as 92 – 63 = 29.

[1] The correct application of the exterior angle theorem is shown, but one or more computational errors are made.

or

[1] The correct application of supplementary angles and the sum of the angles of a triangle are shown, but one or more computational errors are made.

or

[1] m$\angle BCA$ is calculated incorrectly, but the sum of the angles in a triangle is used appropriately.

or

[1] 29, 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.

(22) **[2]** 15, and appropriate work is shown, such as using the Pythagorean theorem, Pythagorean triples, or trigonometric functions.

[1] The data are substituted incorrectly, but an appropriate answer is found and is rounded correctly.

or

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

or

[1] 15, 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]** $4x^2 + 10x + 2$, and appropriate work is shown, such as $(9x^2 + 3x - 4) - (5x^2 - 7x - 6)$.

[1] The setup is correct, but the distribution of the negative sign is incorrect.

or

[1] $14x^2 - 4x - 10$, but appropriate work is shown.

or

[1] $4x^2 + 10x + 2$, 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.

(24) **[2]** $6x - 2$ or an equivalent expression, and appropriate work is shown, such as $2(2x + 3) + 2(x - 4) = 6x - 2$.

[1] The length is represented correctly as $2x + 3$ and the width as $x - 4$, but the representation of the perimeter is determined incorrectly.

or

[1] The length, the width, and the perimeter are represented appropriately, but by a variable other than x.

or

[1] One or both dimensions are represented incorrectly, but the perimeter is represented appropriately.

[0] One or both dimensions are represented incorrectly, and the perimeter is not determined.

or

[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]** $5rs^2\sqrt{2}$, and appropriate work is shown.

[1] A partially correct answer is found, such as $5r\sqrt{2s^4}$ or $5s^2\sqrt{2r^2}$, and appropriate work is shown.

or

[1] $7.07rs^2$, but appropriate work is shown.

or

[1] $5rs^2\sqrt{2}$, 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.

Part III

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

(26) **[3]** 490, and appropriate work is shown, such as 7•7•10.

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

or

[2] Appropriate work is shown, but an incorrect answer is found, based on an incorrect number of possible dessert combinations or an incorrect number of soup or appetizer choices.

or

[2] Appropriate work is shown, but an incorrect answer is found, based on one error in the tree diagram.

or

[2] $\frac{1}{490}$, but appropriate work is shown.

[1] 7, 7, and 10 are added instead of multiplied.

or

[1] The counting principle is used correctly, but incorrect substitutions are made, but an appropriate answer is shown.

or

[1] 490, 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.

(27) **[3]** $\frac{2}{24}$ or an equivalent answer, and an appropriate explanation is given or appropriate work is shown, such as a tree diagram, sample space, or permutations.

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

or

[2] Appropriate work is shown, but only a numerator or a denominator is determined correctly.

or

[2] $\frac{2}{24}$ or an equivalent answer, but only work for either the numerator or the denominator is shown.

[1] The probability of the tallest or the probability of the shortest student being in the proper position is correct, such as $\frac{1}{4}$.

or

[1] Only a tree diagram, sample space, or permutations are shown.

or

[1] $\frac{2}{24}$ 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.

(28) **[3]** ΔABC and $\Delta A'B'C'$, $A'(-2,4)$, $B'(0,12)$, $C'(10,8)$, are graphed correctly.

[2] ΔABC is graphed correctly, but only two image points are graphed correctly.

or

[2] ΔABC is graphed incorrectly, but $\Delta A'B'C'$ is graphed appropriately, based on an incorrect ΔABC.

[1] Only ΔABC is graphed correctly.

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

(29) **[3]** All three examples are illustrated under division correctly, such as $2 \div 0$, $-2 \div 4$, and $-2 \div -4$, and correct explanations are given.

[2] Only two of the three examples are illustrated and explained correctly.

or

[2] All three examples are illustrated correctly, but only one explanation is given or is correct.

or

[2] The division examples and explanations are correct, but at most two incorrect examples are also shown, such as examples for addition, subtraction, or multiplication.

[1] The division examples and explanations are correct, but more than two incorrect examples are shown, such as examples for addition, subtraction, or multiplication.

or

[1] All three examples are illustrated correctly, but no correct explanation is given.

or

[1] Only one correct example with a correct 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.

(30) **[3]** Three correct equations are shown, such as $y = x + 7$, $y = -x - 6$, and $2y = 2x - 12$.

[2] Only two correct equations are shown.

[1] Only one correct equation 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 IV

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

(31) *a* **[3]** Two parallel lines, one 3 units above and one 3 units below $\overleftrightarrow{AB}$, and a circle with its center at P with a radius of 5 units are described correctly in words or drawn.

[2] Only one parallel line 3 units above or 3 units below $\overleftrightarrow{AB}$ and a correct circle are described in words or drawn.

or

[2] Appropriate parallel lines are shown, but the circle is incomplete.

[1] Both parallel lines and the circle have incomplete descriptions or drawings.

[0] Only one incomplete locus is described or drawn.

b **[1]** 4, and appropriate work is shown.

or

[1] An appropriate answer for an incorrect part *a* is found.

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.

(32) **[4]** 36 T-shirts and 12 caps, and appropriate work is shown, such as an appropriate system of equations or a correct trial-and-error method with at least two trials and appropriate checks.

[3] Appropriate work is shown, but only the correct number of T-shirts or the correct number of caps is determined.

or

[3] One error is made, resulting in an incorrect number of T-shirts or caps, but the corresponding number of the other item is determined appropriately.

[2] An appropriate method is shown, but no answer is found.

or

[2] The variables are represented correctly, and a correct equation or system of equations is written, but the process is not completed.

or

[2] 36 T-shirts and 12 caps, but only one trial and appropriate checks are shown.

or

[2] The variables are represented correctly, but an incorrect equation is written, but the solution is completed appropriately.

[1] 36 T-shirts and 12 caps, 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) **[4]** 153, and appropriate work is shown, such as $\sin 50° = \frac{x}{200}$.

[3] An appropriate analysis is shown, but one computational or rounding error is made.

[2] An incorrect trigonometric function is used, such as $\cos 50° = \frac{x}{200}$, but it is carried to an appropriate final answer and is rounded correctly.

[1] An incorrect trigonometric function is used and solved appropriately, but it is rounded incorrectly.

or

[1] Only an appropriate diagram is shown.

or

[1] 153, but no work is shown.

[0] Use of the Pythagorean theorem, such as $200^2 = 50^2 + x^2$, 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.

(34) **[4]** Correct cumulative frequencies of 7, 14, 24, and 30 and a fully labeled correct histogram are shown.

[3] Incorrect cumulative frequencies are shown, but the histogram is appropriate for the data.

or

[3] Correct cumulative frequencies are shown, but a partially incorrect histogram is shown, such as the axes not being labeled, having nonequal intervals, or the x-axis starting at 50.

[2] Only a frequency histogram is completed correctly.

or

[2] Only a correct cumulative frequency table and a correct bar graph are shown.

[1] An appropriate bar graph is shown, but it is based on frequencies, not the cumulative frequency.

or

[1] Only a correct cumulative frequency table 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) **[4]** (–3,–5) and (1,3), and appropriate algebraic work is shown.

[3] Appropriate algebraic work is shown, but $x = -3$ and $x = 1$ are given as the solution.

or

[3] Appropriate algebraic work is shown, but only one correct solution is given, such as (1,3).

[2] (–3,–5) and (1,3), but a graphic solution is shown.

or

[2] Correct substitution and an algebraic equation set equal to zero are shown, but the result is not factored, such as $x^2 + 2x - 3 = 0$.

[1] Any correct substitution is shown, such as $2x + 1 = x^2 + 3x - 2$.

or

[1] (–3,–5) and (1,3), but no algebraic 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.

Map to Learning Standards

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

Regents Examination in Mathematics A

August 2001

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

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.