FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS A

Tuesday, June 17, 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) 2	(6) 2	(11) 4	(16) 2
(2) 4	(7) 4	(12) 3	(17) 4
(3) 1	(8) 3	(13) 1	(18) 1
(4) 1	(9) 1	(14) 1 and 3	(19) 4
(5) 2	(10) 3	(15) 1	(20) 2

Part II

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

(21) **[2]** 77, and appropriate work is shown, such as (76 + 78) ÷ 2.

[1] 76 and 78 are identified.

or

[1] 77, 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]** 160, and appropriate work is shown, such as the proportion $\frac{25}{16} = \frac{250}{x}$.

[1] Appropriate work is shown, but one computational error or one conceptual error is made, such as $\frac{5}{4} = \frac{250}{x}$.

or

[1] 160, 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]** 2, and appropriate work is shown.

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

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.

(24) **[2]** 31, and appropriate work is shown, such as $5x + 25 = 180$.

[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 setting the given angles equal to each other.

or

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

or

[1] 31, 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]** A correct construction is drawn to find the midpoint of $\overline{BC}$, showing both sets of arcs and a line connecting A with the midpoint.

[1] A correct construction is drawn to find the midpoint of $\overline{BC}$, but the median is not drawn.

or

[1] The construction is appropriate, but a compass and a straightedge are not used.

[0] No construction arcs are 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.

Part III

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

(26) **[3]** Seth had 101, Jason had 51, and Raoul had 104, and appropriate work is shown, such as $x + 25 = (2x - 1) - 25$ 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] 101, 51, and 104, and appropriate work is shown, but the solutions are not labeled or are labeled incorrectly.

or

[2] A correct equation is solved, but the number of CDs for only one boy 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] Appropriate work is shown, but more than one computational error is made.

or

[1] Appropriate work is shown, but one conceptual error is made, but an appropriate number of CDs is found for each boy.

or

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

or

[1] Seth had 101, Jason had 51, and Raoul had 104, but no work or only one trial with an appropriate check is shown.

[0] Seth had 101 *or* Jason had 51 *or* Raoul had 104, but no work is shown.

or

[0] 101, 51, and 104, but no work is shown and the solutions are not labeled or are labeled incorrectly.

or

[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]** 64, and appropriate work is shown, such as calculating $\frac{(36 \times 144)}{(9 \times 9)}$ or drawing a labeled diagram.

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

or

[1] 64, 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]** 7,625 and 66.7%, and appropriate work is shown.

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

or

[2] Only the number of votes for candidate *B* is found correctly, but appropriate work is shown.

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

or

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

or

[1] The percent of votes cast for candidate *A* is found correctly, but no further correct work is shown.

or

[1] 7,625 and 66.7%, but no work is shown.

[0] 7,625 *or* 66.7%, 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.

(29) **[3]** Option 2 will yield 82,576,000 more possibilities, and appropriate work is shown, such as $26^3 \bullet 10^4$ and ${}_{26}P_4 \bullet {}_{10}P_3$.

[2] Appropriate work is shown, but one computational error is made, but the appropriate option is identified.

or

[2] The correct numbers of arrangements are found for both Option 1 and Option 2, but the question of which option will yield more arrangements is not answered or is answered incorrectly.

[1] Appropriate work is shown, but more than one computational error is made, but the appropriate option is identified.

or

[1] Appropriate work is shown, but one conceptual error is made, but the appropriate option is identified.

or

[1] Either Option 1 or Option 2 is found correctly, but no further correct work is shown.

or

[1] Option 2 will yield 82,576,000 more possibilities, but no work is shown.

[0] Option 2, but no work or inappropriate 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.

(30) **[3]** 6.7, and appropriate work is shown, such as using the distance formula.

[2] Appropriate work is shown, but one computational or rounding or graphing error is made or the answer is left in radical form.

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

or

[1] Only an appropriate diagram or graph is shown.

or

[1] The horizontal distance is determined to be 3, and the vertical distance is determined to be 6, but the shortest distance is not found.

or

[1] 6.7, 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.

Part IV

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

(31) **[4]** 11, and appropriate work is shown, such as solving the quadratic equation $3x(x + 5) = 150$ or trial and error with at least three trials and appropriate checks.

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

or

[3] Appropriate work is shown to determine that 5 is the shorter side of the box, but the shorter side of the original sheet is not found or is found incorrectly.

or

[3] An incorrect quadratic equation of equal difficulty is solved appropriately, and an appropriate shorter side of the original sheet is found.

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

or

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

or

[2] An incorrect quadratic equation of equal difficulty is solved appropriately, but the shorter side of the original sheet is not found.

or

[2] A correct quadratic equation is set equal to zero, but no further correct work is shown.

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 one conceptual error and one computational error are made.

or

[1] One conceptual error is made in finding the shorter side of the box, and the corresponding shorter side of the original sheet is not found or is found incorrectly.

(31) continued

or

[1] A correct quadratic equation is written, but it is not set equal to zero, and no further correct work is shown.

or

[1] 11, 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.

(32) **[4]** Two **X**s are indicated at the intersections of the angle bisector and the parallel lines in the correct sketch of the loci.

[3] All loci are drawn correctly, but no **X**s are drawn to indicate the locations, or only one **X** is drawn.

or

[3] The angle bisector is drawn correctly, but only one line is drawn parallel to the walkway, but an **X** is indicated appropriately.

[2] Only one correct locus is drawn, but **X**s indicate the two appropriate locations of the intersection of the loci.

[1] **X**s are drawn in the correct locations, but no loci are shown.

or

[1] Only one correct locus is drawn, and no **X**s are indicated.

or

[1] Both loci are drawn incorrectly, but **X**s are drawn on the appropriate points of intersection.

[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]** 100 and a correct parabolic arch is drawn, and appropriate work is shown, such as a table of values for the parabola or correctly labeled points.

[3] 100 and a correct parabolic arch is drawn, but no table of values or labeled points are shown.

or

[3] 100 and a correct parabolic arch is drawn, and appropriate work is shown, but no scale or an incorrect scale is shown.

or

[3] A correct parabolic arch is drawn, but the maximum height is missing or is incorrect.

[2] An incorrect parabolic arch is drawn, but an appropriate maximum height is found.

or

[2] A correct height is determined algebraically, but a parabolic arch is not drawn.

or

[2] 100 and an appropriate parabolic arch is drawn, but it is not drawn between $0 \le x \le 20$.

[1] A correct parabolic arch is drawn, but no work is shown, such as a table of values or correctly labeled points, and the maximum height is missing or is incorrect.

or

[1] 100, but no work is shown and no parabolic arch 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.

(34) **[4]** 9.4, and appropriate work is shown, such as the use of the Pythagorean theorem.

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

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

or

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

or

[2] An incorrect diagonal of the base is found, but an appropriate solution is found.

or

[2] Only the diagonal of the base is found correctly, but appropriate work is shown, such as $3^2 + 4^2 = d^2$ or use of 3–4–5 right triangles.

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

or

[1] The Pythagorean theorem is used to find the length of the straw, but the appropriate legs are not used.

or

[1] 9.4, 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.

(35) **[4]** $y = 2x - 40$, a correctly drawn graph with a slope of 2 and a y-intercept of –40, and 20, and appropriate work is shown.

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

or

[3] The equation and graph are correct, but the breakeven point is missing or is incorrect.

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

or

[2] An incorrect equation is written, but an appropriate graph is drawn, and an appropriate breakeven point is identified.

[1] An incorrect equation is written, but an appropriate graph is drawn, but the breakeven point is missing or is incorrect.

or

[1] A correct equation is written, but the graph is incorrect, and the breakeven point is not identified.

or

[1] $y = 2x - 40$ and 20, but no work is shown and no 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.

Map to Learning Standards

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

Regents Examination in Mathematics A

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