FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS A

Wednesday, August 16, 2000 — 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 Examination in Mathematics A*.

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/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) 4	(11) 2	(16) 3
(2) 1	(7) 3	(12) 2	(17) 1
(3) 4	(8) 4	(13) 4	(18) 3
(4) 1	(9) 1	(14) 3	(19) 4
(5) 2	(10) 4	(15) 3	(20) 1

Part II

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

(21) **[2]** 24 miles and appropriate work is shown, such as using a proportion, showing doubling of the sides, or using any other appropriate method.

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

or

[1] An incorrect proportion is appropriately solved.

or

[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.

(22) **[2]** $\frac{x-3}{3}$ and multiplication by the reciprocal, correct factoring, and canceling are shown.

[1] The difference of two squares, $x^2 - 9 = (x + 3)(x - 3)$, is factored correctly.

or

[1] Appropriate work is shown, but the final answer is incorrect.

or

[1] $\frac{x-3}{3}$ 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.

(23) **[2]** Kerry is incorrect and an explanation is given that the original area is 24 ft^2 and the area of the rose plot is 6 ft^2, which is not half of 24 ft^2.

or

[2] Kerry is incorrect and an explanation is given that since the original area is 24 ft^2, the area of the rose plot should be 12 ft^2, so the new dimensions should multiply to 12, such as 3 ¥ 4, 4 ¥ 3, 2 ¥ 6, or 6 ¥ 2.

or

[2] Kerry is incorrect and a diagram is used to show the original area is 24 ft^2 and the area of the rose plot is 6 ft^2.

[1] Kerry is incorrect but the work or diagram shows one error.

or

[1] Appropriate work is shown, but the incorrect conclusion is found.

[0] Kerry is incorrect or correct but no explanation is given.

or

[0] Kerry is correct and $\frac{1}{2}(4) = 2$ or $\frac{1}{2}(6) = 3$ is shown.

or

[0] Kerry is correct and the student uses the perimeter.

or

[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]** 21 and the student shows an appropriate solution, such as the equation $x + x + 1 + x + 2 = 63$ or trial and error.

[1] Appropriate work is shown, but an incorrect answer is found.

or

[1] An incorrect equation is shown, but it is solved appropriately to find an answer, such as $x + x + 2 + x + 4 = 63$.

or

[1] 21 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]** 6 and appropriate work is shown, such as using the combination ${}_4C_2$, listing all six possible outcomes, or drawing a correct tree diagram.

[1] A correct setup of combinations is shown, but an incorrect solution, such as leaving ${}_4C_2$, or no integral solution is found.

or

[1] An appropriate list or tree diagram is shown, but an incorrect solution is found, such as 5, by omitting one of the possible combinations.

or

[1] 12 but a complete list or tree diagram is shown.

or

[1] 6 but no work is shown.

[0] The answer is completely incorrect, such as ${}_4P_2$ or 4 ¥ 3.

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]** Juliet and an explanation is given of how the identification was reached, such as by a narrative or table.

[2] One error is made in the logic statements or the table, but appropriate results are found.

[1] More than one error is made in the logic statements or the table, but appropriate work is shown.

or

[1] Juliet 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]** 1.3 and appropriate work is shown, such as calculating the circumference of the wheel and the length of the trail in feet, and converting them to miles, such as $\frac{2 \cdot p \cdot 1100.5}{5280}$.

[2] The student correctly calculates the circumference and length in feet but does not convert them to miles.

or

[2] Correct calculations are shown, but the answer is rounded incorrectly or is not rounded.

or

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

[1] The correct circumference is calculated.

or

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

or

[1] 1.3 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.

(28) **[3]** Yes, A'' is (1,–3) and B'' is (2,–1) and appropriate work is shown, algebraically or graphically.

[2] Correct coordinates for A'' and B'' are found, but no conclusion is shown.

or

[2] Either A'' or B'' is correct, and an appropriate conclusion is shown.

or

[2] One transformation is correct and one is incorrect, such as the reflection in y, but an appropriate conclusion is shown.

[1] Neither transformation is correct, but an appropriate conclusion is shown.

or

[1] One transformation 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.

(29) **[3]** $\frac{48}{100}$ or any equivalent fraction or 0.48 or 48% and appropriate work is shown, such as on Monday $\frac{2}{10}$ have power, $\frac{8}{10}$ lost power; on Tuesday $\frac{1}{2}\left(\frac{8}{10}\right) = \frac{4}{10}$ have been restored, therefore $\frac{2}{10} + \frac{4}{10} = \frac{6}{10}$ have power; on Wednesday $\frac{2}{10}$ lose power, therefore $\left(\frac{8}{10}\right)\left(\frac{6}{10}\right) = \frac{48}{100}$ have power.

[2] Appropriate work is shown, but one computational error is made, leading to a fractional answer.

or

[2] One error of having or losing power is made, such as taking 20% of $\frac{4}{10}$.

[1] Appropriate work is shown, but multiple computational errors are made.

or

[1] The correct answer is found, 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.

(30) **[3]** 10.6 and the Pythagorean theorem, $C^2 = 8^2 + 7^2$, or any other appropriate method is shown.

[2] Appropriate work is shown, but the answer is left as $\sqrt{113}$ or is rounded incorrectly.

or

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

[1] Appropriate work is shown, but multiple errors are made.

or

[1] The only correct work shown is a correctly drawn diagram with three distances labeled.

or

[1] 10.6 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]** 283.5 or 284 and appropriate work or an explanation is shown, such as $4x + 12 = 96$, $\frac{21 \text{¥} 27}{2}$, or trial and error.

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

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

or

[2] 283.5 or 284 and only a check is shown.

[1] Appropriate work is shown, but no answer is found.

or

[1] 283.5 or 284 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) **[4]** The student draws parallelogram *ABCD* correctly, identifies *D*(1,3), and justifies the coordinates of *D* by using any appropriate method to show *ABCD* is a parallelogram.

[3] The student draws parallelogram *ABCD* incorrectly but justifies *D* appropriately.

or

[3] The student draws parallelogram *ABCD* correctly and identifies *D*(1,3), but the justification is incomplete.

[2] The student draws parallelogram *ABCD* correctly and identifies *D*(1,3), but no justification is shown.

[1] The student either draws parallelogram *ABCD* correctly or identifies *D*(1,3) correctly.

[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]** 114" (9 feet 6 inches) and 37" (3 feet 1 inch) and appropriate work is shown, such as $\sin 72° = \frac{x}{10}$ and $\cos 72° = \frac{y}{10}$ or use of the Pythagorean theorem.

[3] An incorrect diagram is drawn, but appropriate work and an appropriate solution for that diagram are shown.

or

[3] Appropriate work is shown, but the answers are rounded to the nearest foot and then converted to inches, arriving at 120" and 36".

or

[3] The setup is correct, but the answers are not converted to the nearest inch.

[2] One correct dimension is shown, such as 114" (9 feet 6 inches) or 37" (3 feet 1 inch).

or

[2] Only one error involving interchanging sine and cosine is made.

or

[2] An incorrect diagram is drawn, and the solution is appropriate for the diagram but is not rounded to the nearest inch.

[1] The student switches sine and cosine and does not round to the nearest inch.

or

[1] The student uses the correct trigonometric function to compute one side correctly but does not convert it to the nearest inch.

or

[1] 114" (9 feet 6 inches) and 37" (3 feet 1 inch) 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) **[4]** 7.98×10^6 or 7,980,000 and appropriate work is shown, such as $8 \times 10^6 - 2 \times 10^4$.

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

or

[3] The student uses 1–9 instead of 0–9 as the number of digits in $8 \times 9^6 - 2 \times 9^4$.

[2] The student correctly produces only one part, 8×10^6 or 2×10^4, but carries the process to an appropriate result.

or

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

[1] The student produces only one part, 8×9^6 or 2×9^4.

or

[1] 7,980,000 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]** 16 and appropriate work is shown, such as $W(W + 2) = 15$.

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

or

[3] $L = 5$, $W = 3$, and the perimeter = 16, but no work is shown.

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

or

[2] $L = 5$, $W = 3$, and appropriate work is shown, but the perimeter is not found.

or

[2] The length and width are incorrect, but the perimeter is computed appropriately.

[1] Length and width are appropriately defined in terms of a single variable.

or

[1] 16 but no work is shown.

[0] $L = 5$ and $W = 3$ but no work is shown, and the perimeter is not 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.

Map to Learning Standards

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

Regents Examination in Mathematics A

August 2000

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

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.