

FOR TEACHERS ONLY

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

MATHEMATICS B

Thursday, June 20, 2002 — 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 B 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) 4	(6) 3	(11) 1	(16) 3
(2) 2	(7) 4	(12) 3	(17) 4
(3) 2	(8) 3	(13) 2	(18) 3
(4) 1	(9) 4	(14) 4	(19) 1
(5) 4	(10) 1	(15) 2	(20) 3

Part II

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

- (21) [2] The Adams School, and an appropriate explanation is given, such as the standard deviation is a measure of dispersion, which is how much the scores, on the average, differ from the mean. Therefore, the school with the smaller standard deviation would have the more consistent scores.

[1] The Adams School, but an incomplete explanation is given, or the school is not stated, but an appropriate 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.

- (22) [2] No, and appropriate work is shown, such as setting the expressions equal to each other, with one trials showing that the two expressions are not always equal.

[1] No, but only one trial shows that the two expressions are not always equal.

or

[1] Yes, but appropriate work is shown, such as using 0° and 180° as trials.

[0] No or yes, and no work or incorrect 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 B – *continued*

(23) [2] $\frac{9}{64}$, and appropriate work is shown, such as ${}_3C_2\left(\frac{1}{4}\right)^2\left(\frac{3}{4}\right)^1$.

[1] Only ${}_3C_2\left(\frac{1}{4}\right)^2\left(\frac{3}{4}\right)^1$ is shown.

or

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

or

[1] $\frac{9}{64}$, 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.

(24) [2] 12, and appropriate work is shown, such as solving $2,500 = 4(2.7)^{0.584t}$.

[1] Appropriate work is shown, but the answer is not rounded or is rounded to 11.

or

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

or

[1] 12, 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 B – *continued*

(25) [2] 300, and appropriate work is shown.

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

or

[1] 300, 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.

(26) [2] More than 6 hours, and appropriate work is shown, using a graphic or algebraic solution.

[1] Appropriate work is shown, but one computational error or an error in analyzing the results is made.

or

[1] More than 6 hours, 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 four credits.

- (27) [4] $\bar{x} = 5.5$, $\sigma = 0.5$, and the range is 4–7, and appropriate work is shown.
- [3] $\bar{x} = 5.5$, $\sigma = 0.5$, but one computational error is made when finding the range, but appropriate work is shown.
- or***
- [3] \bar{x} is correct, but σ is incorrect, but the range is appropriate, based on the incorrect σ .
- or***
- [3] \bar{x} is incorrect, but σ and the range are appropriate, based on the incorrect \bar{x} .
- [2] \bar{x} is incorrect and σ is incorrect, but the range is appropriate, based on the incorrect \bar{x} and σ .
- or***
- [2] \bar{x} is correct and σ is correct, but the range is not determined.
- [1] $\bar{x} = 5.5$, $\sigma = 0.5$, and the range is 4–7, 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.
- (28) [4] Yes, and appropriate work is shown, and an appropriate justification is given.
- [3] Appropriate work is shown, and an appropriate justification is given, but one computational error is made, or the negative value of t is not rejected.
- [2] An appropriate graph or equation is shown, such as $16t^2 - 8t - 15 = 0$.
- [1] An incorrect graph or equation of equal difficulty is used, but an appropriate solution is found.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

MATHEMATICS B – *continued*

(29) [4] The reasons for all four steps are correct, such as:

Step 3: Perpendicular line segments form right angles.

Step 6: If two parallel lines are cut by a transversal, the alternate interior angles are congruent.

Step 8: $AAS \cong AAS$.

Step 9: Corresponding parts of congruent triangles are congruent.

[3] The reasons for only three steps are correct.

[2] The reasons for only two steps are correct.

[1] The reason for only one step 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.

(30) [4] 5 and -4 , and appropriate work is shown.

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

[2] The correct log equation, $\log_4 \frac{x^2+3x}{x+5} = \log_4 4$, is shown, but no further work or incorrect work is shown.

[1] One correct logarithmic step is shown, such as $\log_4 \frac{x^2+3x}{x+5}$.

or

[1] 5 and -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.

MATHEMATICS B – *continued*

- (31) [4] 41, and appropriate work is shown.
- [3] Appropriate work is shown, but one computational or rounding error is made.
- [2] One incorrect formula is used, but an appropriate answer is found.
- or***
- [2] Appropriate work is shown, but one computational and one rounding error are made.
- [1] 41, 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] 0.15 hour or 9 minutes or an appropriately rounded answer, and appropriate work is shown, such as using the Law of Cosines.
- [3] Appropriate work is shown, but one computational or rounding error is made.
- [2] The correct distance along County Route 21 is found, but no further work or incorrect work is shown.
- or***
- [2] Appropriate work is shown, but one computational and one rounding error are made.
- [1] The Pythagorean theorem is used to find the distance along County Route 21, and this distance is used to compare travel times.
- or***
- [1] 0.15 hour 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.
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Part IV

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

- (33) [6] 30, 150, and 270, and appropriate work is shown.
- [5] Appropriate work is shown, but one computational error is made.
- [4] The correct equation is shown, but only two correct solutions are found.
- [3] The correct equation is shown, but only one correct solution is found.
- [2] The correct equation is solved for x , but no further work is shown.
- [1] The correct equation is shown, but no further work is shown.
- or***
- [1] 30, 150, and 270, 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 B – *concluded*

(34) [6] A correct scatter plot, $y = (0.002)(1.070)^x$, and \$1.52 or an equivalent answer, and appropriate work is shown.

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

[4] A correct scatter plot is shown, but an incorrect equation of equal difficulty is used, but an appropriate fare for 1998 is determined, based on the incorrect equation.

or

[4] A correct scatter plot with a function other than exponential is used, but an appropriate equation and fare derived from that equation are shown.

[3] A correct scatter plot is shown, and an appropriate fare based on the scatter plot is found, but no equation or work is shown.

[2] Only a correct scatter plot is shown.

[1] \$1.52, 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 B

Map to Learning Standards

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

Regents Examination in Mathematics B

June 2002

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

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 B examination.