

FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS A

Tuesday, January 25, 2000 — 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 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) 3	(6) 3	(11) 4	(16) 1
(2) 1	(7) 3	(12) 2	(17) 3
(3) 3	(8) 2	(13) 1	(18) 4
(4) 1	(9) 4	(14) 4	(19) 2
(5) 1	(10) 1	(15) 4	(20) 2

Part II

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

- (21) [2] $(-6,8)$ or $-6,8$ or $x = -6$ and $y = 8$ and an appropriate explanation is given, such as graphing the line or doubling the coordinates.

[1] One correct coordinate and one incorrect coordinate are found.

or

[1] An appropriate method is shown, such as algebraic or graphing, but computational mistakes are made.

or

[1] $(-6,8)$ or $-6,8$ or $x = -6$ and $y = 8$ and no explanation is given.

or

[1] Substitutions are correct for the midpoint formula, but computational mistakes are made.

or

[1] The student properly locates point B on the graph but does not state its coordinates.

or

[1] Point A and point M are reversed, resulting in $B(3,-4)$, and an explanation is given.

[0] Only the midpoint of \overline{AM} $\left(-\frac{3}{2}, 2\right)$ 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.

- (22) [2] 4.5 and an appropriate method is shown, such as the equation $3x + x + 2 = 20$ or some trial and error or arithmetic process.

[1] An appropriate method is shown, but the correct answer is not found.

or

[1] 4.5 and no work is shown.

or

[1] The student solves the equation $x + 3x - 2 = 20$ and answers 5.5.

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

[2]

- (23) [2] 8 and the use of trigonometry, the Pythagorean theorem, *or* Pythagorean triple is shown.
- [1] The Pythagorean theorem *or* trigonometry is used, but a computational mistake is made *or* substitution is incorrect, such as $6^2 = 10^2 + x^2$.
- or***
- [1] 8 and 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 an appropriate explanation is given.
- [1] The student uses an appropriate method, such as showing $\frac{k-2}{3-1} = 5$ or graphing of a line through (1,2) having a slope of 5, but the correct answer is not found.
- or***
- [1] 12 and no 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.
- (25) [2] The student draws a parallelogram, which is not a rectangle, with four sides and four angles labeled, such as angles of 60, 120, 60, and 120 and sides of 4, 6, 4, and 6.
- [1] A parallelogram *or* rhombus, *not* a square, is drawn, which does not have measures for all lengths or angles.
- [0] Angles and/or lengths are *not* appropriate for a parallelogram.
- or***
- [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] 95 and an appropriate method is shown that obtains an answer, such as $344 - 249$ or a similar equation or method.

or

- [3] Four scores are tried that round off to an average of 86, such as 93 or 94. Round off to 86 must be shown.

- [2] An appropriate method is shown, but one computational mistake is made.

- [1] The student understands weighted average and shows that the average of 83 for 3 tests is a total of 249 points.

or

- [1] 95 and 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] 3 hours and an appropriate method or equation is shown, such as $45(x + 1) = 60x$.

- [2] An appropriate method is shown, but an incorrect answer is found, such as 4 hours (the truck's time) or 180 miles traveled.

- [1] An appropriate equation or method is shown, but no answer is found, such as showing an equation that reflects a one-hour difference in time but it is not solved.

or

- [1] 3 hours and 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) *a* [2] 15 and an appropriate method is shown, such as finding $GB = JC = 2x$ and $FC = ED = HJ = 3$.

[1] 15 and no work is shown.

or

[1] At least one of the values is correct, as shown above, and the area is calculated based on the incorrect value.

- b* [1] Any form equivalent to $(2x + 5)(x + 3)$ is shown, such as $5x + 2x^2 + 6x + 15$.

or

[1] Any correct total area based on the student's incorrect answer in 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.

- (29) *a* [2] A correct circle is sketched with its center at (2,1) and a radius of 3 and the line $2x + y = 8$ is drawn.

[1] Only one of the graphs is sketched correctly.

b [1] 2

or

[1] The correct number of intersections is found, based on the incorrect graphs drawn 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 – *continued*

(30) [3] 3, 12, and 30 and an appropriate arithmetic method or equation is shown, such as $40x^3 = 1080$.

[2] An appropriate equation or method is shown, but not all three dimensions are found.

or

[2] An appropriate method is shown, and although one computational mistake is made, the student does find three dimensions based on this mistake, such as dividing 1080 by 40 incorrectly.

[1] The student shows that multiplication is required to find volume but sets up an incorrect method and does not find three dimensions.

or

[1] 3, 12, and 30 and no work is shown.

[0] The sum is used instead of the product.

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 IV

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

(31) *a* [3] A parabola is correctly graphed through (0,0), (1,5), (2,8), (3,9), (4,8), (5,5), and (6,0).

[2] The correct table of values is shown but is not graphed through the entire domain.

or

[2] The correct points are graphed but as a broken line graph not a curve.

or

[2] At least three values are correctly calculated and graphed.

[1] At least two of the values are correctly calculated, and the student tried to graph all points.

b [1] 3

or

[1] The correct time, x , for an incorrect graph in 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) *a* [2] An appropriate histogram is drawn with both axes labeled with a correct numerical scale.

[1] A correct bar graph is drawn.

or

[1] The parts of the histogram are not labeled.

or

[1] Equal interval scales are not shown.

or

[1] One error on frequency calculation is made.

[0] Two or more mistakes on frequency calculation are made.

b [2] 60% and an appropriate explanation is given.

[1] An appropriate method to find percent is shown, but a mistake is made in reading the chart, such as $\frac{6}{15} = 40\%$ or $\frac{9}{15}$ is shown but not given as a percent answer.

or

[1] 60% and no explanation is given.

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.

- (33) *a* [2] An appropriate equation or system is shown, such as $x + y = 148$ and $12x + 9y = 1410$ or one equation such as $12(148 - x) + 9x = 1410$ with variables identified.

[1] The student shows appropriate equation(s), but variables are not defined.

or

[1] One mistake in equation(s) is made, *or* only one equation with two variables is shown, but variables are defined.

b (1)

[1] 26 and an appropriate method is shown, such as solving the equation or making a table.

or

[1] An appropriate answer is found based on incorrect equation(s) obtained in part *a*.

b (2)

[1] 122 and an appropriate method is shown, such as $148 - 26$.

or

[1] An appropriate answer is found based on incorrect equation(s) obtained in part *a*.

b (1) and *b* (2)

[1] 26 and 122 and no work is shown.

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.

- (34) *a* [2] 10 and an appropriate tree diagram, list, sample space, *or* ${}_5C_3 = 10$ is shown.

[1] 10 and no work is shown.

or

[1] An appropriate method is shown, but not all 10 possible combinations are listed.

b [1] $\frac{1}{10}$

or

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

c [1] $\frac{4}{10}$ *or* $\frac{2}{5}$ *or* 0.4

or

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

a and *b* and *c*

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

(35) *a* [2] 3 and an appropriate method is shown, such as trial and error or the equation $32 + 8x = 26 + 10x$.

[1] 3 and no work is shown.

or

[1] An appropriate method is shown, but an incorrect answer is found.

b (1)

[1] Best Cable Company and an appropriate explanation is given.

b (2)

[1] \$24 and an appropriate explanation is given.

b (1) and *b* (2)

[1] Best Cable Company and \$24 and no work is shown.

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.

Regents Examination in Mathematics A

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

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.