

FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS A

Tuesday, June 22, 1999 — 9:15 a.m. to 12:15 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) 4	(6) 2	(11) 1	(16) 3
(2) 3	(7) 1	(12) 2	(17) 3
(3) 3	(8) 2	(13) 2	(18) 1
(4) 1	(9) 3	(14) 4	(19) 2
(5) 2	(10) 4	(15) 4	(20) 1

Part II

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

- (21) **[2]** Both correct lines of symmetry are drawn: one horizontal, one vertical.
[1] Only one correct line is drawn.
or
[1] Two correct and one or two incorrect lines, such as the diagonals, are drawn.
[0] More than two incorrect lines are drawn.
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) a **[1]** $\frac{S + 24}{3}$ *or* $\frac{S}{3} + 8$
 b **[1]** 11.5
or
[1] Correct substitution into an incorrect part *a* is shown, and the answer is given to the nearest tenth of an inch.
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.
- (23) **[2]** $\sqrt{20}$ and an appropriate explanation is given, such as the number cannot be written as a repeating or terminating decimal or it cannot be written as a fraction or it is not a perfect square.
[1] $\sqrt{20}$ and an inappropriate explanation *or* no explanation is given.
or
[1] $\sqrt{20}$ and a correct explanation is given, but one other number is also identified as irrational.
[0] All three numbers are identified as irrational.
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]** $\frac{3x}{3x + 5y}$
[1] One correct factoring is shown, either $3x(3x - 5y)$ *or* $(3x - 5y)(3x + 5y)$.
[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]** 38 and an appropriate method is shown, such as $36.64 - (21 + 6.14) = 9.50$ and $\frac{9.50}{.25} = 38$ or an equation such as $21 + .25c + 6.14 = 36.64$.

[1] 38 and no work is shown.

or

[1] An appropriate method or equation is shown, but one computational mistake is made.

or

[1] The answer of \$9.50 for local calls is found but is not divided by .25.

[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]** 4 and an appropriate method is shown, such as calculating *A* at 6 mph and *B* at 2 mph through arithmetic, formula, or extending the graph to 60 minutes.

[2] The speeds of 6 and 2 are found but not their difference.

or

[2] Their difference is found but not in miles per hour.

[1] Only distances of 4.5 miles and 1.5 miles are found.

or

[1] The speeds found are incorrect but then are subtracted appropriately.

or

[1] 3 times as fast and no appropriate explanation is given.

or

[1] 4 and no 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.

- (27) **[3]** 27 and an appropriate method or explanation is shown, such as $\left(\frac{1}{6}\right)\left(\frac{1}{3}\right)\left(\frac{2}{3}\right) = \frac{1}{27}$ of a cubic foot, thus 27 bricks needed or, in inches, $\frac{1728}{64} = 27$. A labeled drawing is an acceptable explanation.
- [2]** An appropriate method for finding volume is shown, but one computational mistake is made.
- [1]** Correct conversion into feet is shown.
- or***
- [1]** The volume of 64 cubic inches is found.
- or***
- [1]** 27 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.
- (28) **[3]** 15 and an appropriate method or explanation is shown, such as trial and error or the inequality $6x + 15 \leq 100$.
- [2]** An appropriate method is shown, but it stops at 14.
- [1]** An appropriate method is shown, but no answer is found.
- or***
- [1]** 15 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.
- (29) **[3]** 34 and an appropriate explanation is given, such as $38 = \frac{46 + 2x}{3}$.
- [2]** An appropriate method or equation is shown, but one computational mistake is made.
- or***
- [2]** The student does not take into consideration two dogs of equal weight and gives an answer of 68.
- [1]** The student understands weighted average in that three dogs averaging 38 pounds must have a total weight of 114 pounds but does not subtract the known weight.
- or***
- [1]** 34 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.

- (30) **[3]** 135 and appropriate work is shown.
- [2]** The two correct angles of 65° and 70° are found, but their sum is not identified as the answer to the question.
- or***
- [2]** 65° *or* 70° and an appropriate sum is found.
- [1]** Either the 65° *or* the 70° is correctly identified.
- or***
- [1]** Two incorrect angle measures are found, but they are added correctly.
- or***
- [1]** 135 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.
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Part IV

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

(31) *a* **[2]** 125.6 *or* 125.7 (correct for the value of π used) and appropriate work is shown.

[1] The area is left as 40 *or* the answer is not rounded correctly.

or

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

or

[1] The correct areas of both circles are found, but the two areas are not subtracted.

or

[1] The circumference formula is used correctly for both circles and the circumferences are subtracted for an answer of 25.1.

or

[1] 125.6 *or* 125.7 and no work is shown.

b **[2]** 49 and an appropriate explanation is given.

or

[2] An appropriate percent for an incorrect part *a* is found and supported by area formulas.

[1] The answer is left as $\frac{40}{81}$.

or

[1] An appropriate fraction for an incorrect part *a* is found but not given as a percent.

or

[1] An appropriate percent for an incorrect part *a* is found and is supported by circumference formulas.

or

[1] 49 and no work is shown.

[0] $\frac{4}{9}$ *or* 44% and no work is shown.

or

[0] 4 is found by subtracting the radii.

or

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] $\frac{30}{72}$ or an equivalent value is found and an appropriate explanation is given.

[1] An acceptable method is used correctly, such as a tree diagram, sample space, or combinations, but the correct answer is not given.

or

[1] Replacement is used, and an answer of $\frac{36}{81}$ or an equivalent is found.

or

[1] $\frac{30}{72}$ and no work is shown.

b [2] $\frac{36}{72}$ or an equivalent value is found and an appropriate explanation is given.

or

[2] An appropriate probability for an incorrect denominator for part *a* is found.

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

or

[1] Replacement is shown, and the answer $\frac{36}{81}$ or an equivalent is found.

or

[1] The student does not take into account both orders and answers $\frac{18}{72}$ or an equivalent.

or

[1] $\frac{36}{72}$ and no work is shown.

or

a and *b*

[1] An error in method is made but the erroneous answer is interpreted correctly in either part *a* or *b* or both.

[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]** 12 and an appropriate method is shown, such as $(AB)^2 = 9^2 + 8^2$.
- [3]** An incorrect length is found for AE , but then it is used to correctly complete the problem.
- or***
- [3]** An appropriate method is shown, but one computational mistake is made.
- or***
- [3]** An appropriate method is shown, but the answer is not given to the nearest foot, such as $\sqrt{145}$.
- [2]** $AE = 8$ and one computational mistake is made using the Pythagorean theorem.
- or***
- [2]** An incorrect length is found for AE , but then it is used to complete the problem correctly, but the answer is not rounded.
- [1]** $AE = 8$ is found, but the Pythagorean theorem is not used.
- or***
- [1]** 12 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.

- (34) **[4]** 116 and an appropriate method is shown.
- [3]** An appropriate method is shown, but the answer is left in an inappropriate form, such as 116.2.
- or***
- [3]** An appropriate method is shown, but 3 feet is not added, and the answer is left 113.
- or***
- [3]** Tangent function is used, but computational mistakes are made, but 3 feet is added to the incorrect value and the answer is found correctly.
- [2]** An incorrect trigonometric function is used, 3 feet is added, and the answer is rounded correctly.
- or***
- [2]** Tangent function is used, but computational mistakes are made, and 3 feet is not added to an incorrect answer.
- [1]** 116 and no work is shown.
- or***
- [1]** An incorrect trigonometric function is used, and 3 feet is added to the incorrect answer, but the answer is rounded incorrectly.
- [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]** (3,14) and (-2,-1) and either an algebraic *or* a graphic solution is shown.
- [3]** An appropriate method is shown, but only one correct ordered pair is identified.
- or***
- [3]** An appropriate method is shown, but one computational mistake is made.
- or***
- [3]** An appropriate method is shown, but values are given only for x .
- [2]** The substitution is correct, but the quadratic produced is not factored correctly.
- or***
- [2]** Both equations are graphed correctly, but neither ordered pair is identified.
- [1]** Only one equation is graphed correctly.
- or***
- [1]** The substitution is incorrect, but it produces a linear equation that is solved correctly.
- or***
- [1]** Only the substitution 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.
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Regents Examination in Mathematics A

June 1999

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

65	86	36	58	7	26
64	85	35	56	6	25
63	84	34	55	5	24
62	83	33	54	4	23
61	82	32	53	3	22
60	81	31	52	2	21
59	80	30	51	1	10
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.