FOR TEACHERS ONLY

MATHEMATICS A

Thursday , August 12, 1999 — 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) 4	(6) 3	(11) 1	(16) 3
(2) 1	(7) 2	(12) 1	(17) 3
(3) 2	(8) 2	(13) 3	(18) 4
(4) 3	(9) 4	(14) 3	(19) 1
(5) 1	(10) 2	(15) 4	(20) 2

Part II

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

(21) **[2]** 2.4 and appropriate work is shown.

[1] The student shows correct use of the distributive property to obtain $2x - 6$ *or* other appropriate algebraic technique.

or

[1] 2.4 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.

(22) *a* **[1]** A correct tree diagram *or* listing of all 8 possibilities is shown.

  b **[1]** $\frac{1}{8}$

or

[1] An appropriate answer is given for an incorrect part *a* tree diagram or listing.

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]** 72 and an appropriate method, such as $3 \times 6 \times 4$, is shown.

[1] 72 and no explanation is given.

or

[1] An appropriate method is shown, but the student has one computational mistake or an incomplete listing, such as 2 of the 3 clothing categories.

[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]** 100 and an appropriate method is shown, such as 360 – 300 = 60 degrees, which is $\frac{1}{6}$ of the circle so $\frac{1}{6}$ of 600 is 100.

     [1] 100 and no explanation is given.

or

     [1] An incorrect degree measure is used to develop a fraction by which to multiply 600, obtaining an appropriate answer.

or

     [1] A correct degree measure is used to develop $\frac{1}{6}$.

or

     [1] 60 degrees is used, but an incorrect number of people is found.

     [0] Only 60 degrees 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.

(25)   **[2]** 2 and an appropriate sketch of two circles intersecting in two points is shown.

     [1] 2 and no sketch is shown.

or

     [1] An appropriate sketch is shown, without indicating 2 as the possibilities.

or

     [1] An appropriate number is found, based on an inappropriate sketch.

     [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]** −8 and 5 and appropriate work is shown, such as factoring or trial and error.

[2] The student shows correct factoring into $(x + 8)(x − 5)$ *or* correct use of the quadratic formula but finds only one correct value for *x*.

[1] Correct factoring is shown, but no values are found.

or

[1] Incorrect factoring is shown, but two appropriate values are found.

or

[1] Either −8 *or* 5 is arrived at by trial and error.

or

[1] −8 and 5 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]** 12 and the equation $\tan x = \dfrac{420}{2000} = .21$ is shown.

or

[3] 12 and the Pythagorean theorem and an appropriate trigonometric function are correctly used.

[2] Tan function is correctly used, but the answer is not rounded, such as 11.859.

or

[2] The setup is correct, but one computational mistake is made, and an appropriate angle is found.

or

[2] The answer is incorrectly expressed, such as $\tan x = 12$.

[1] The tan function is set up correctly, but the angle is not computed.

or

[1] 12 and no work is shown.

or

[1] 12 and $\sin x = \dfrac{420}{2000}$ is used.

or

[1] 78 and $\cos x = \dfrac{420}{2000}$ is used.

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

[4]

(28) **[3]** 2, 6, 10, 14, and 18 and an appropriate method is shown.

[2] One mistake is made with selection, such as including 0.

[1] One of the appropriate sets is found: either 2, 4, 6, 8, 10, 12, 14, 16, 18, 20 *or* not 4, 8, 12, 16, 20.

or

[1] The correct numbers are found, 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.

(29) **[3]** The student says the point does not lie on the line and an appropriate method is shown, such as slope of –2 does not work with the new point (–25,81) and either other point (0,4) or (2,0), or accurately shows a graph where (–25,81) is not on line ℓ.

[2] The student says the point does not lie on the line but gives an inappropriate explanation of slope.

or

[2] The student tries to use slope concept but makes one computational mistake and gives an appropriate answer based on this mistake.

[1] Only the slope of –2 is found.

or

[1] The correct diagram is drawn with no interpretation.

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

[5] [OVER]

(30)   **[3]** No, it will not differ and the student shows that both methods lead to $47.08, such as $55 × .80 = $44, $44 × 1.07 = $47.08, $55 × 1.07 = $58.85, and $58.85 × .80 = $47.08.

[2] Both ways are computed, one computational mistake is made, and an appropriate answer is found.

or

[2] Both ways are computed correctly, but no comparison is found.

[1] At least one way is computed correctly, but no comparison is found.

or

[1] Both ways are computed incorrectly, but an appropriate comparison is found.

[0] Both ways are computed incorrectly, and no comparison 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.

Part IV

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

(31) **[4]** $52,950, $35,300, and $88,250 and an appropriate method is shown, such as $3x + 2x + 5x = \$176,500$.

[3] A correct equation is set up or multiplied by correct fractional values $\frac{3}{10}$, $\frac{2}{10}$, and $\frac{5}{10}$, but a computational mistake is made, and three appropriate values are found.

or

[3] An appropriate method is shown, but not all three values are found.

[2] The equation is set up correctly, but numerous computational mistakes are made, and three appropriate values are found.

or

[2] An incorrect equation is shown, but three appropriate values are found.

or

[2] An appropriate equation is shown but is solved only for x (17,650).

[1] The equation is set up correctly, but no appropriate values are found.

or

[1] Three correct answers are found, 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.

(32) **[4]** $2,950.33 and a correct method is shown, such as area 1204 square feet multiplied by $0.78.

<div align="center">***or***</div>

[4] Various correct values of are used that lead to slightly different totals such as $2,948.84 (if 3.14 is used).

[3] The shaded area is found, such as 1204 (or similar values based on approximation).

<div align="center">***or***</div>

[3] The correct shaded area is found, but one computational mistake is made in the price, *or* the final cost is not rounded correctly.

[2] The two separate areas are found but not correctly used.

<div align="center">***or***</div>

[2] An inappropriate formula for areas is shown, but work is carried to an appropriate value.

<div align="center">***or***</div>

[2] Only one appropriate area is found and an appropriate cost is computed.

<div align="center">***or***</div>

[2] The area found is incorrect but calculated to an appropriate cost.

[1] Only one appropriate area is found, either 2500 or 1296 .

<div align="center">***or***</div>

[1] An inappropriate area is found, and one computational mistake is made in calculating the cost.

<div align="center">***or***</div>

[1] $2,948.84 through $2,950.33 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.

(33) *a* **[3]** A parabola is correctly graphed through (0,0), (1,10), (2,16), (3,18), (4,16), (5,10), and (6,0).

[2] A correct table of values is shown, but not all the points are graphed correctly.

or

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

or

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

[1] The student has at least two of the values calculated correctly and has tried to graph all the points.

[0] Fewer than two values are calculated correctly.

b **[1]** A maximum height of 18 is found.

or

[1] Correct *y* is found for an incorrect graph 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.

(34) **[4]** 270 and an appropriate method is shown, such as using the Pythagorean theorem or trigonometry to find base $AC = 36$.

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

[2] An inappropriate formula for the area of the triangle is used, but work is carried to a solution.

or

[2] The Pythagorean theorem is used correctly, but only the area of triangle ADB is found, as 150.

or

[2] The Pythagorean theorem is used incorrectly arriving at incorrect AB, but work is carried to its appropriate solution for triangle ADC.

[1] Only the area of triangle DBC is found, as 120.

or

[1] The Pythagorean theorem is used incorrectly, and the area is not found.

or

[1] 270 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.

(35) *a* **[1]** $50

b (1) **[1]** 5

(2) **[1]** $125

c **[1]** $10

a, 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.

Regents Examination in Mathematics A

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

Raw Score	Scaled Score	Raw Score	Scaled Score	Raw Score	Scaled Score
65	**83**	36	**54**	7	**21**
64	**82**	35	**53**	6	**18**
63	**81**	34	**52**	5	**15**
62	**80**	33	**51**	4	**12**
61	**79**	32	**50**	3	**9**
60	**78**	31	**49**	2	**6**
59	**77**	30	**48**	1	**3**
58	**76**	29	**47**	0	**0**
57	**75**	28	**46**		

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.