

FOR TEACHERS ONLY

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

MATHEMATICS A

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

Part II

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

- (21) [2] 18 and correct substitution, $F = \frac{9}{5}(-8) + 32$, is shown.
- [1] A correct substitution method is shown, but one computational error is made.
- or**
- [1] The answer is not rounded to the nearest integer, such as 17.6 or $17\frac{3}{5}$.
- or**
- [1] The student substitutes -8 for F , but then solves appropriately for C .
- or**
- [1] The student substitutes $+8$ for C , but then solves appropriately for F .
- or**
- [1] 18 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] The arcs on the lines are clearly drawn, and the line bisecting the angle is clearly shown.
- [1] Only the angle bisection is shown. No arcs are drawn on the lines.
- or**
- [1] The arcs on the lines are drawn, but no angle bisection is shown.
- [0] The line is drawn but not in the middle. No compass was used.
- or**
- [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] 8,100 and appropriate work is shown, such as $9 \times 10 \times 10 \times 9$.
- [1] 10,000 but appropriate work is shown.
- or**
- [1] Appropriate work is shown, but the student multiplies incorrectly.
- or**
- [1] An appropriate pattern is shown, such as $9 \times 10 \times 10 \times 9$.
- or**
- [1] 8,100 but no work is shown.
- [0] 38 is shown.
- or**
- [0] The student attempts to use the counting principle, but adds.
- 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] 24 feet and appropriate work is shown, such as $\frac{10}{15} = \frac{16}{x}$ or $\frac{10}{16} = \frac{15}{x}$.
- [1] An appropriate proportion is shown, but an incorrect solution or no solution is found.
- or**
- [1] An incorrect proportion of equal difficulty is shown, but an appropriate solution for the proportion written is found.
- or**
- [1] 24 feet 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 A – *continued*

(25) [2] \$390 or 390 and appropriate work is shown, such as a numerical table or the equation $y = 30x + 90$ or the expression $90 + 30N$.

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

or

[1] \$300 or 300 or a slope of 30 but appropriate work is shown.

or

[1] \$390 or 390 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 three credits.

- (26) [3] 84% and appropriate work is shown, such as mathematics or technology = 42, the total = 50, and the percentage = 84%.
- [2] The correct numbers of students are shown, but the percentage is incorrect.
- or*
- [2] One error in computing the numbers of students is made, but the percentage is appropriate for those numbers.
- [1] Only one number is correct, such as 28 taking mathematics.
- or*
- [1] An appropriate percentage is shown for two incorrect values.
- or*
- [1] 84% 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] The student draws an obtuse triangle and all sides and all angles are correctly calculated, such as by using 120° , 30° , and 30° and sides 4, 4, and 10.
- [2] The student has the angles correctly indicated and the two congruent sides marked, but the length of the longest side is incorrect or is missing.
- or*
- [2] All sides are correctly marked, but the angles do not add to 180° , but an obtuse angle and two congruent angles are shown.
- [1] Only the angles are correctly shown.
- or*
- [1] Only the sides are correctly 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 A – *continued*

(28) [3] 5-inch box and appropriate work is shown, including showing a diameter between 4 and 5.

[2] The correct diameter is shown, but the wrong box size is chosen.

or

[2] The correct radius is shown, but the 3-inch box is chosen.

[1] The correct diameter or radius is shown, but no box is chosen.

or

[1] An appropriate radius between 2 and 3 is shown, using the incorrect formula $A = \pi r^2$, and the 3-inch box is chosen.

or

[1] An appropriate diameter, using $A = \pi r^2$, is shown, but the appropriate box is chosen.

or

[1] An appropriate radius, using $A = \pi r^2$, is shown, but no box is chosen.

or

[1] The 5-inch box is chosen, 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 A – *continued*

(29) [3] 499 days and appropriate work is shown, such as $\frac{17,000,000 \text{ miles}}{1420 \frac{\text{miles}}{\text{hour}} \times 24 \frac{\text{hours}}{\text{day}}}$.

[2] Appropriate work is shown, but one computational error is made or the student incorrectly calculates 1.7×10^7 by one decimal place.

or

[2] Appropriate work is shown, but the answer is rounded incorrectly or is not rounded.

[1] $1.7 \times 10^7 = 17,000,000$ is shown.

or

[1] $\frac{1.7 \times 10^7}{1420} = 11,971.831$ hours is shown.

or

[1] 34,080 miles in 1 day is shown.

or

[1] 499 but no work is shown.

[0] The student does not understand scientific notation.

or

[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] 109 meters and appropriate work is shown by using an appropriate trigonometric ratio, such as $\tan 32^\circ = \frac{y}{175}$.

[2] 109 meters but one rounding error is made.

or

[2] The student uses an appropriate trigonometric function with an inverted ratio, such as $\tan 32^\circ = \frac{175}{y}$, but completes the calculation appropriately, such as showing 280 meters.

[1] The student uses an incorrect trigonometric ratio but completes the calculation appropriately.

or

[1] The student uses an inverted tangent ratio and makes one computational or rounding error.

or

[1] The student uses the correct trigonometric ratio but solves it incorrectly or does not solve it at all.

or

[1] 109 meters but no work or explanation 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] 65 adult tickets and 85 student tickets and an appropriate equation is shown, such as $7.50x + 4.75(150 - x) = 891.25$, or any other acceptable method is used.

[3] Either 65 or 85 and appropriate work is shown.

or

[3] Appropriate work is shown, but one computational error is made that leads to two appropriate answers.

[2] An incorrect equation is shown, but it is solved appropriately for two answers.

or

[2] The correct equation is shown, but two computational errors are made.

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

or

[1] 65 and 85 but no work is shown.

[0] Either 65 or 85 and no 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 A – *continued*

- (32) [4] A correct diagram is drawn, two **X** points are marked, a numerical 2 is given for the places to dig, and appropriate work is shown.
- [3] The diagram is correct including two **X** points, but an incorrect answer or no answer is found.
- [2] One correct locus situation and one incorrect locus situation are drawn, but the answer is appropriate according to the diagram.
- or***
- [2] Each locus situation is correctly drawn, but no **X** points are marked, and no numerical answer is found.
- [1] Only one locus situation is correctly drawn and an incorrect conclusion or no conclusion is shown.
- or***
- [1] 2 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.

- (33) [4] A correct table and histogram with appropriate labels and scales are shown, such as the table below.

| SCORE | TALLY | FREQUENCY |
|-------|-------|-----------|
| 40-49 | / | 1 |
| 50-59 | / | 1 |
| 60-69 | /// | 3 |
| 70-79 | /// | 3 |
| 80-89 | /// | 3 |

- [3] An incorrect table is shown, but the histogram is appropriate, based on this table.

or

- [3] A correct table is shown, but one error is made on the histogram, such as using incorrect labels or no labels.

or

- [3] An incomplete table is shown, but the histogram is correct.

- [2] An incomplete table is shown, and the histogram is partially correct.

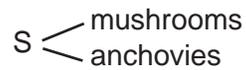
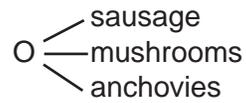
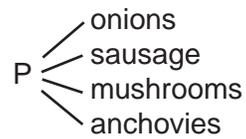
or

- [2] A correct table is shown, and a correct bar graph is made.

- [1] A correct table 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] $\frac{4}{10}$ and appropriate work is shown, such as the following illustration or any other correct method:



M — anchovies

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

or

- [3] Appropriate work and complement $\frac{6}{10}$ are shown.

or

- [3] Appropriate work is shown, but the answer is incomplete.

- [2] ${}_5C_2$ and the work is appropriate but incomplete.

or

- [2] 10 but appropriate work is shown.

or

- [2] A correct sample space or tree diagram is shown.

- [1] Incorrect work leading to $0 \leq \text{fraction} \leq 1$ or $0 \leq \text{percent} \leq 100$ is shown.

or

- [1] $\frac{4}{10}$ 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] Width = 20 and length = 25 and an appropriate algebraic equation is shown, such as $x^2 + 5x - 500 = 0$.

[3] A correct quadratic equation is shown, but one error is made.

or

[3] A correct quadratic equation is shown, but solved for only one dimension.

[2] An appropriate solution is shown, but the student fails to reject the negative root and finds two sets of dimensions.

or

[2] The quadratic equation $(5x)(x) = 500$ is solved appropriately for both dimensions, $x = 10$ and $5x = 50$.

[1] The student writes only the correct quadratic equation or only the equation $x(x + 5) = 500$ or fails to solve the equation correctly.

or

[1] The student writes a linear equation from $x(x + 5) = 500$, such as $2x + 5x = 500$, but solves that equation appropriately.

or

[1] A correct equation is shown for the perimeter and solved appropriately.

or

[1] $(5x)(x) = 500$ is solved correctly for only one dimension.

or

[1] 20 and 25 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 A

Map to Learning Standards

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

Regents Examination in Mathematics A

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

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.