The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS B

Tuesday, June 15, 2010 — 9:15 a.m. to 12:15 p.m., only

Print Your Name:

Print Your School's Name:

Print your name and the name of your school in the boxes above. Then turn to the last page of this booklet, which is the answer sheet for Part I. Fold the last page along the perforations and, slowly and carefully, tear off the answer sheet. Then fill in the heading of your answer sheet.

Scrap paper is not permitted for any part of this examination, but you may use the blank spaces in this booklet as scrap paper. A perforated sheet of scrap graph paper is provided at the end of this booklet for any question for which graphing may be helpful but is not required. You may remove this sheet from this booklet. Any work done on this sheet of scrap graph paper will *not* be scored. Write all your work in pen, except graphs and drawings, which should be done in pencil.

The formulas that you may need to answer some questions in this examination are found on page 19. This sheet is perforated so you may remove it from this booklet.

This examination has four parts, with a total of 34 questions. You must answer all questions in this examination. Write your answers to the Part I multiple-choice questions on the separate answer sheet. Write your answers to the questions in Parts II, III, and IV directly in this booklet. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc.

When you have completed the examination, you must sign the statement printed at the end of the answer sheet, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during the examination. Your answer sheet cannot be accepted if you fail to sign this declaration.

Notice. . .

A graphing calculator, a straightedge (ruler), and a compass must be available for you to use while taking this examination.

The use of any communications device is strictly prohibited when taking this examination. If you use any communications device, no matter how briefly, your examination will be invalidated and no score will be calculated for you.

DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

Part I

Answer all questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. For each question, write on the separate answer sheet the numeral preceding the word or expression that best completes the statement or answers the question. [40]

1 Pete and Sean decide to raise money for a charity by having a carnival in their backyard. In one of the games that they set up, the probability that a person will win is 0.4. If Robyn plays that game nine times, what is the probability that she wins *exactly* four times?

(1) $_9C_5 \, (0.4)^5 \, (0.4)^4$ (3) $_9C_4 \, (0.4)^4 \, (0.6)^5$

(2) $_9C_4 \, (0.5)^4 \, (0.5)^5$ (4) $_9C_5 \, (0.4)^5 \, (0.6)^4$

2 Which number is the largest?

(1) $\left(\frac{1}{4}\right)^{-1}$ (3) $\left(\frac{1}{4}\right)^{\frac{1}{2}}$

(2) $\left(\frac{1}{4}\right)^{0}$ (4) $\left(\frac{1}{4}\right)^{2}$

3 The point $A(6,3)$ maps onto $A'(2,1)$ under a dilation with respect to the origin. What is the constant of dilation?

(1) $\frac{1}{3}$ (3) 3

(2) $\frac{1}{2}$ (4) -2

4 If $\cos \theta = -\frac{4}{5}$ and θ lies in Quadrant II, what is the value of $\tan \theta$?

(1) $\frac{3}{4}$ (3) $-\frac{3}{4}$

(2) $\frac{4}{3}$ (4) $-\frac{4}{3}$

5 Tracy, a political campaign organizer, realizes that the number of hours needed to get out a mailing for her candidate is inversely proportional to the number of campaign workers she has. If she uses the information in the accompanying graph, how many hours would it take to do the mailing if 125 workers are used?
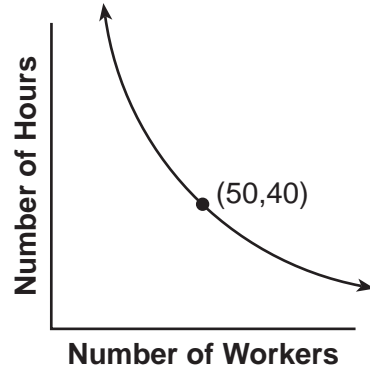
(1) 12   (3) 20
(2) 16   (4) 24

6 What is $\dfrac{\tan x}{\sec x}$ expressed in simplest form?

(1) $\dfrac{\sin x}{\cos^2 x}$ (3) $\dfrac{\sin^2 x}{\cos x}$

(2) $\dfrac{1}{\cos x}$ (4) $\sin x$

7 What is the value of $\displaystyle\sum_{r=0}^{3} {}_3C_r$?

(1) 8   (3) 3
(2) 9   (4) 4

8 What is the exact value of $\cos(\text{Arc }\sin\frac{1}{2})$?

(1) $\frac{1}{2}$

(3) $\frac{\sqrt{3}}{2}$

(2) $\sqrt{3}$

(4) $\frac{\sqrt{2}}{2}$

9 If $7^x = 3$, then x is equal to

(1) $(\log 3)(\log 7)$

(3) $\dfrac{\log 3}{\log 7}$

(2) $\log 3 - \log 7$

(4) $\dfrac{\log 7}{\log 3}$

10 The roots of the equation $2x^2 + 5x - 6 = 0$ are

(1) rational and unequal   (3) irrational and unequal
(2) rational and equal   (4) imaginary

11 If the measure of $\angle A = 40°$, $a = 5$, and $b = 6$, how many different triangles can be constructed?

(1) 1   (3) 3
(2) 2   (4) 0

12 Which is the equation of the axis of symmetry of the graph of the equation $y = x^2 - 3x - 6$?
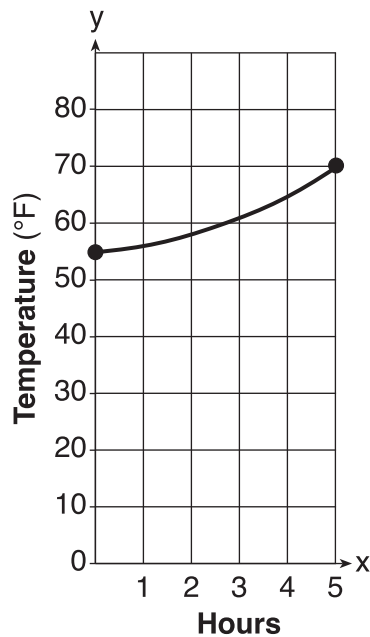
(1) $x = 3$

(3) $y = 3$

(2) $x = \frac{3}{2}$

(4) $y = \frac{3}{2}$

13 The air temperature in Dallas, Texas, over a 5-hour period is shown in the accompanying graph.
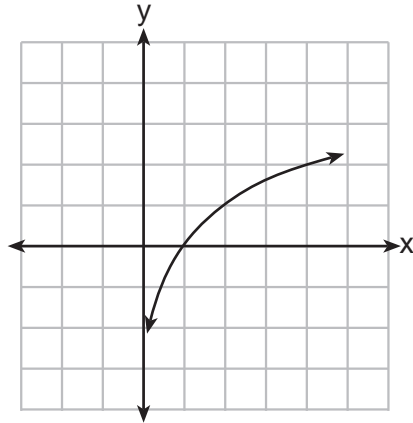
What is the range of this set of data?

(1) $0 \le x \le 5$ (3) $0 \le y \le 80$
(2) $56 \le x \le 70$ (4) $56 \le y \le 70$

14 The expression $\dfrac{1}{2 - i}$ is equivalent to

(1) $2 + i$ (3) $\dfrac{2 + i}{5}$

(2) $-2 - i$ (4) $\dfrac{2 + i}{3}$

15 If $f(x) = 2x - 1$ and $g(x) = 3x + 5$, then $(f \circ g)(x)$ is equal to

(1) $5x + 4$ (3) $6x + 9$
(2) $6x + 2$ (4) $6x^2 + 7x - 5$

16 Which equation is represented by the accompanying graph?

(1) $y = 2^x$ (3) $y = \log x$
(2) $y = 2^{-x}$ (4) $y = \log_2 x$

17 Which quadratic equation has the roots $2 - \sqrt{3}$ and $2 + \sqrt{3}$?

(1) $x^2 - 4x + 7 = 0$ (3) $x^2 - 4x + 1 = 0$
(2) $x^2 + 4x + 7 = 0$ (4) $x^2 + 4x - 1 = 0$

18 What is the solution set of $\sqrt{4x + 21} = x$?

(1) $\{-3\}$ (3) $\{7\}$
(2) $\{-3, 7\}$ (4) $\{\ \}$

19 The graph of the product of $(4 + 3i)$ and $(2 - 3i)$ lies in which quadrant?

(1) I   (3) III
(2) II   (4) IV

20 Which equation represents an ellipse?

(1) $3x^2 = 4 - 5y^2$ (3) $6x^2 = 9 + 8y^2$
(2) $4x^2 = 9 - 4y$ (4) $xy = 12$

Part II

Answer all questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [12]

21 Simplify: $\dfrac{\dfrac{1}{4} + \dfrac{1}{4x}}{\dfrac{1}{x} + \dfrac{1}{4}}$

22 In $\triangle ABC$, $a = 12$, $b = 20.5$, and m$\angle C = 73$. Find the area of $\triangle ABC$, to the *nearest tenth*.

23 Solve for x: $x^{\frac{1}{3}} = 27$

24 Solve for x: $x^2 - 7x + 10 < 0$

25 During a recent time period, the following Apgar scores were recorded at St. Elizabeth's Hospital: 9, 8, 10, 9, 8, 10, 9, 10, 8, 10. Find the population standard deviation of the scores, to the *nearest hundredth*.

26 The tip of a pendulum describes an arc 18 centimeters long when the pendulum swings through an angle of $\frac{3}{4}$ of a radian. Find the length, in centimeters, of the pendulum.

Answer all questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit.   [24]

27 The data table below shows water temperatures at various depths in an ocean.

Water Depth (*x*) (meters)	Temperature (*y*) (°C)
50	18
75	15
100	12
150	7
200	1

Write the linear regression equation for this set of data, rounding all values to the *nearest thousandth*.

Using this equation, predict the temperature (°C), to the *nearest integer*, at a water depth of 255 meters.

28 Express $\dfrac{35x^2 + 2x - 1}{15x + 3} \div \dfrac{2 - 98x^2}{6 + 42x}$ in simplest form.

29 A shape to be used in a computer game is placed on a Cartesian coordinate plane. The equation of the shape is $(x - 4)^2 + (y + 2)^2 = 4$. On the accompanying grid, graph the shape and label it a. In the game, the shape is moved under the composition $T_{2,3} \circ r_{y\text{-axis}}$. Draw the image, label it b, and state its equation.
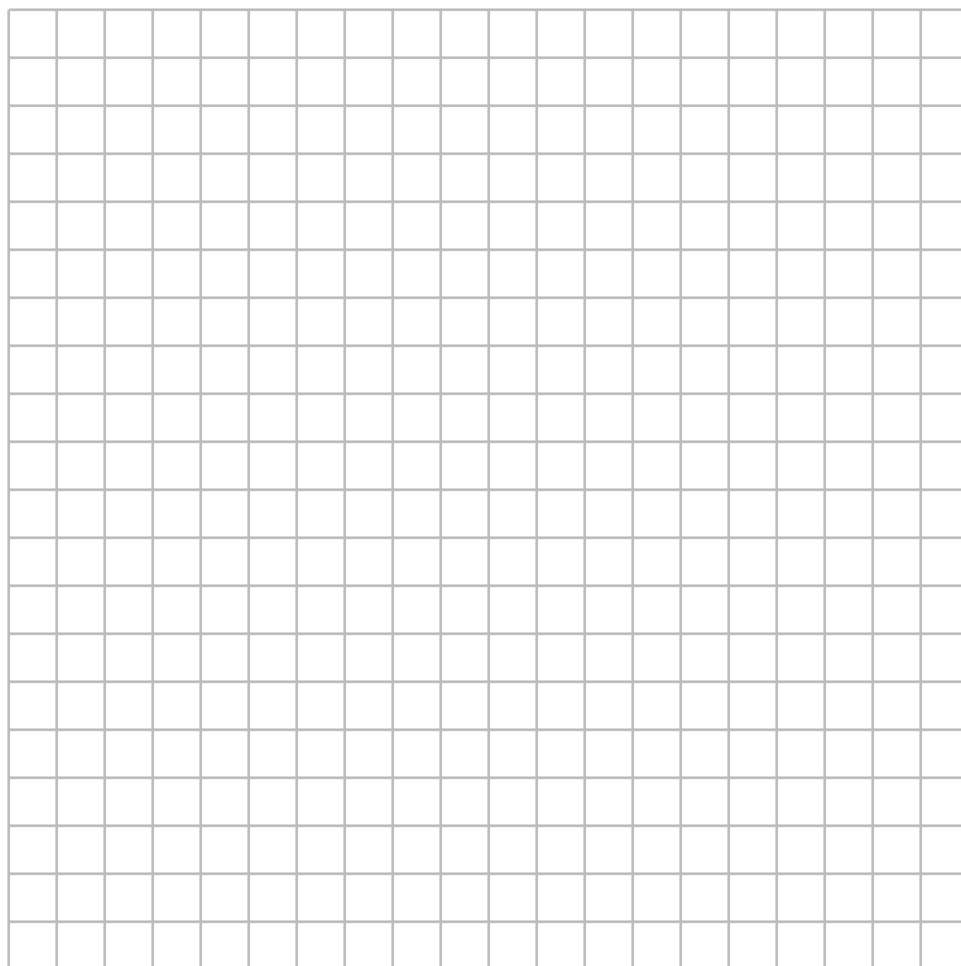
30 As shown in the accompanying diagram, the hypotenuse of the right triangle is 6 meters long. One leg is 1 meter longer than the other. Find the lengths of *both* legs of the triangle, to the *nearest hundredth of a meter.*
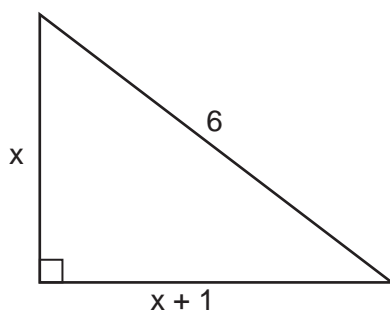
31 Quadrilateral *ABCD* has vertices *A*(2,3), *B*(7,10), *C*(9,4), and *D*(4,−3). Prove that *ABCD* is a parallelogram but *not* a rhombus. [The use of the accompanying grid is optional.]
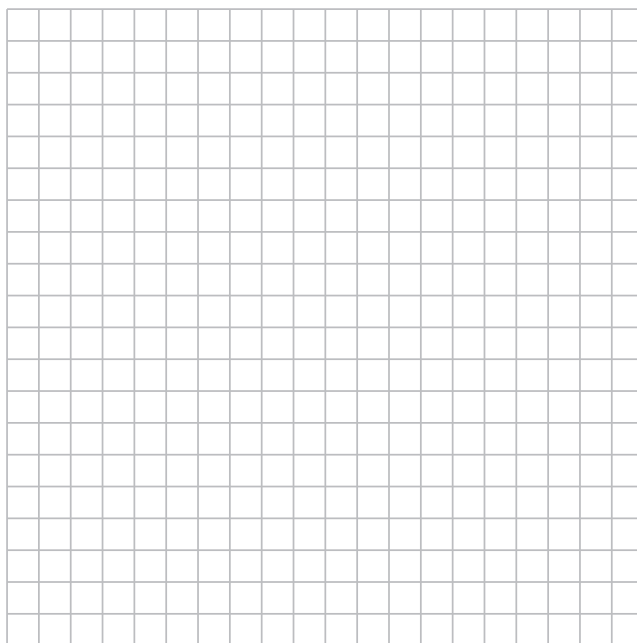
32 Solve the following system of equations algebraically.

$$x^2 - 2y^2 = 23$$
$$x - 2y = 7$$

Part IV

Answer all questions in this part. Each correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [12]

33 In triangle *RST*, *RS* = 50, *ST* = 58, and m∠*S* = 46.

Find *RT*, to the *nearest tenth*.

Using your value for *RT*, find m∠*R*, to the *nearest degree*.

34 Solve algebraically for all values of θ in the interval $0° \le x < 360°$.

$$2 \sin^2 \theta - 4 \sin \theta = \cos^2 \theta - 2$$

Express your answers to the *nearest degree*.

Formulas

Area of Triangle

$$K = \tfrac{1}{2}ab \sin C$$

Functions of the Sum of Two Angles

$$\sin (A + B) = \sin A \cos B + \cos A \sin B$$
$$\cos (A + B) = \cos A \cos B - \sin A \sin B$$

Functions of the Difference of Two Angles

$$\sin (A - B) = \sin A \cos B - \cos A \sin B$$
$$\cos (A - B) = \cos A \cos B + \sin A \sin B$$

Law of Sines

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

Law of Cosines

$$a^2 = b^2 + c^2 - 2bc \cos A$$

Functions of the Double Angle

$$\sin 2A = 2 \sin A \cos A$$
$$\cos 2A = \cos^2 A - \sin^2 A$$
$$\cos 2A = 2 \cos^2 A - 1$$
$$\cos 2A = 1 - 2 \sin^2 A$$

Functions of the Half Angle

$$\sin \tfrac{1}{2} A = \pm \sqrt{\frac{1 - \cos A}{2}}$$

$$\cos \tfrac{1}{2} A = \pm \sqrt{\frac{1 + \cos A}{2}}$$

Normal Curve

Standard Deviation
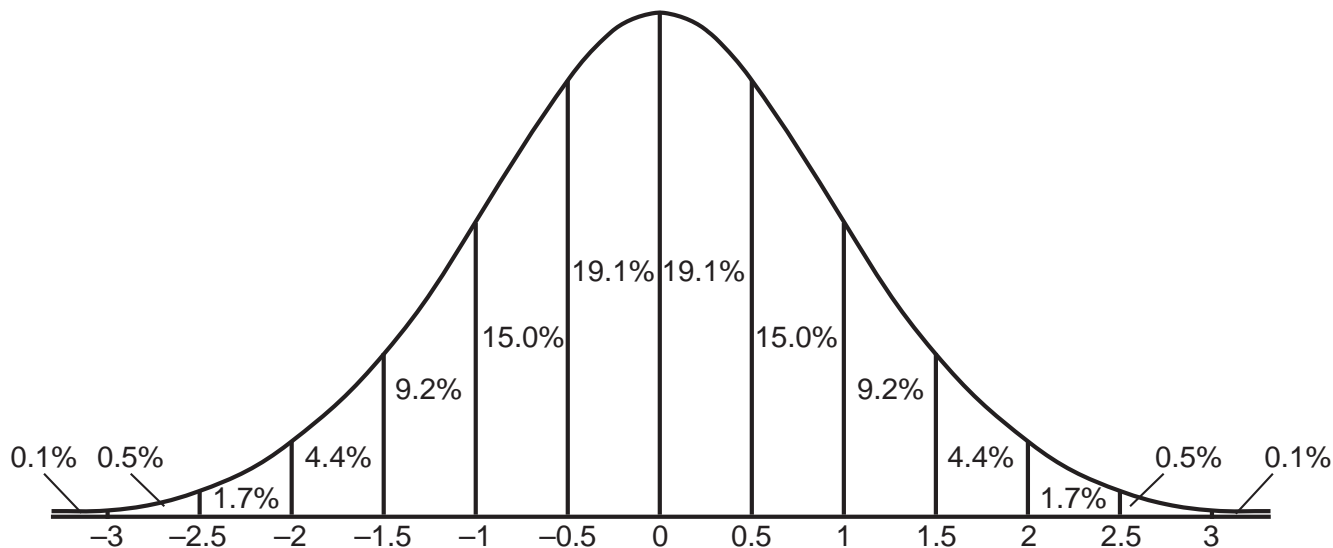
[20]
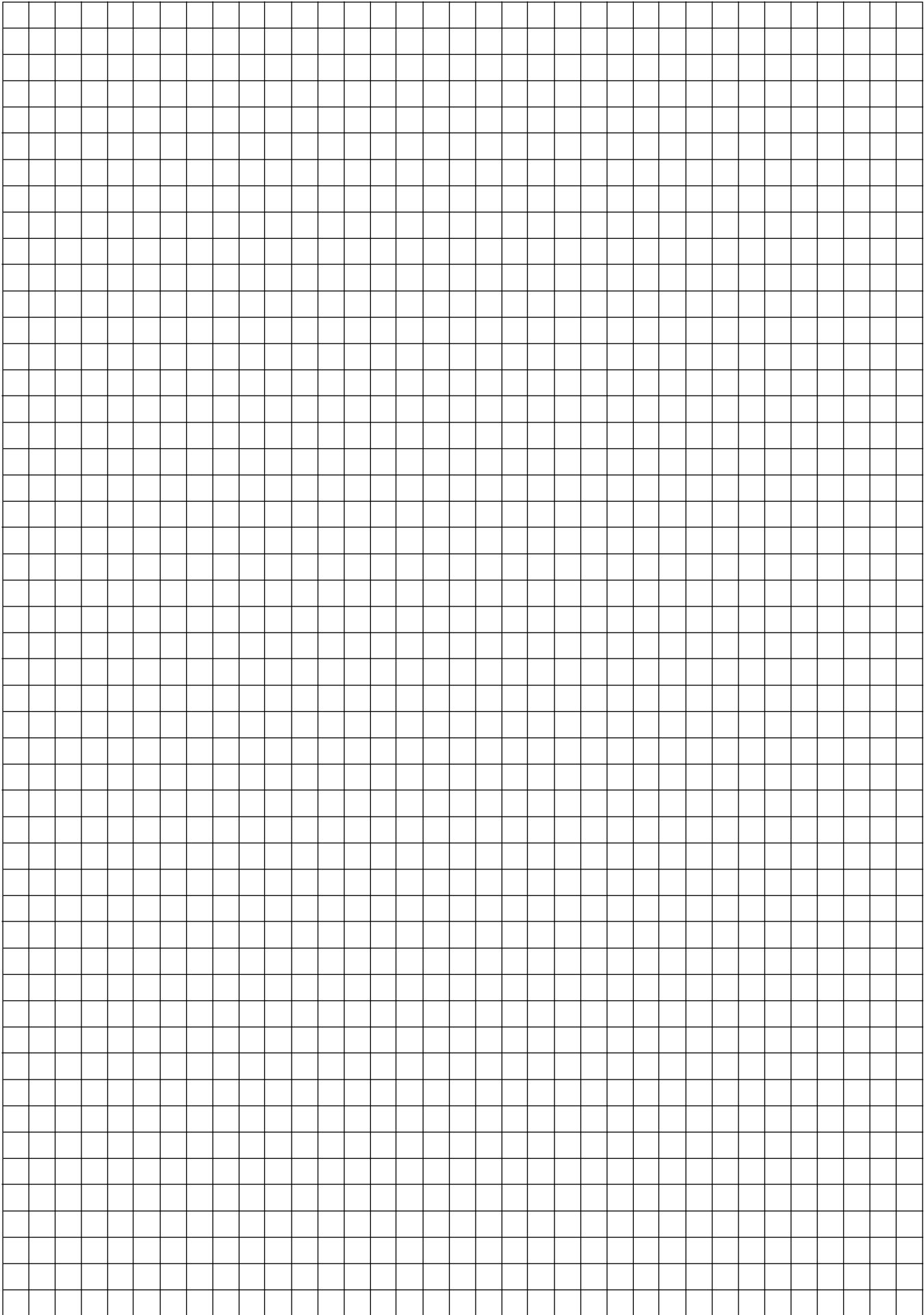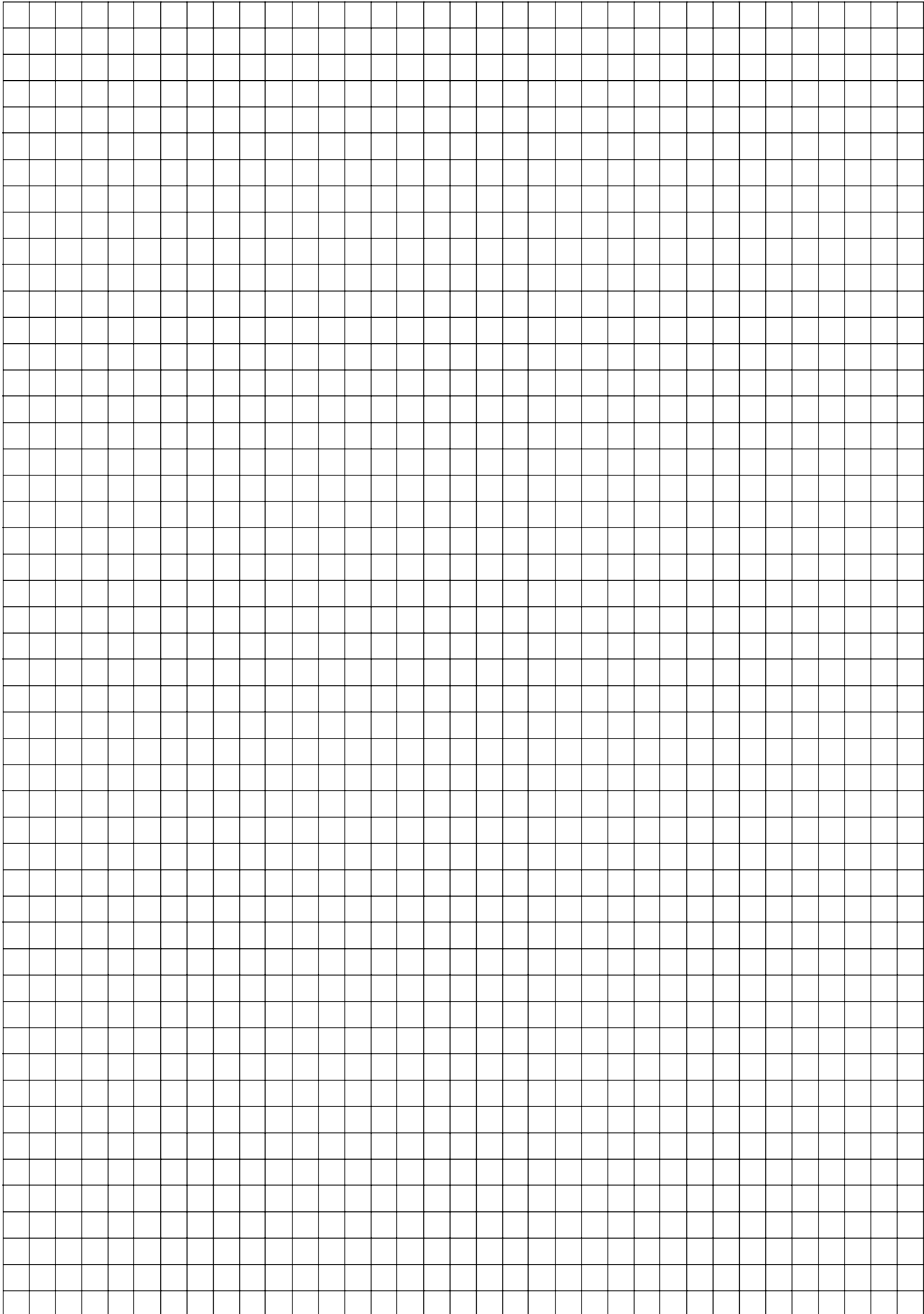
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ANSWER SHEET

Student .... Sex: ☐ Male ☐ Female Grade ....

Teacher .... School ....

Your answers to Part I should be recorded on this answer sheet.

Part I

Answer all 20 questions in this part.

1 .... 6 .... 11 .... 16 ....

2 .... 7 .... 12 .... 17 ....

3 .... 8 .... 13 .... 18 ....

4 .... 9 .... 14 .... 19 ....

5 .... 10 .... 15 .... 20 ....

Your answers for Parts II, III, and IV should be written in the test booklet.

The declaration below must be signed when you have completed the examination.

I do hereby affirm, at the close of this examination, that I had no unlawful knowledge of the questions or answers prior to the examination and that I have neither given nor received assistance in answering any of the questions during the examination.

_____

Signature

Tear Here

Tear Here

MATHEMATICS B

MATHEMATICS B			
Question	Maximum Credit	Credits Earned	Rater's/Scorer's Initials
Part I 1–20	40		
Part II 21	2		
22	2		
23	2		
24	2		
25	2		
26	2		
Part III 27	4		
28	4		
29	4		
30	4		
31	4		
32	4		
Part IV 33	6		
34	6		
Maximum Total	88		

Total Raw Score   **Checked by**   **Scale Score** (from conversion chart)

Rater's/Scorer's Name (minimum of three)

Printed on Recycled Paper

MATHEMATICS B

Tear Here

Tear Here

FOR TEACHERS ONLY

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MATHEMATICS B

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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 Scoring the Regents Examination in 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 check marks 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 scale score by using the conversion chart that will be posted on the Department's web site http://www.emsc.nysed.gov/osa/ on Tuesday, June 15, 2010. The student's scale score should be entered in the box provided on the student's detachable answer sheet. The scale 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) 4	(11) 2	(16) 4
(2) 1	(7) 1	(12) 2	(17) 3
(3) 1	(8) 3	(13) 4	(18) 3
(4) 3	(9) 3	(14) 3	(19) 4
(5) 2	(10) 3	(15) 3	(20) 1

Updated information regarding the rating of this examination may be posted on the New York State Education Department's web site during the rating period. Check this web site http://www.emsc.nysed.gov/osa/ and select the link "Examination Scoring Information" for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and several times throughout the Regents examination period.

General Rules for Applying Mathematics Rubrics

I. General Principles for Rating

The rubrics for the constructed-response questions on the Regents Examination in Mathematics B are designed to provide a systematic, consistent method for awarding credit. The rubrics are not to be considered all-inclusive; it is impossible to anticipate all the different methods that students might use to solve a given problem. Each response must be rated carefully using the teacher's professional judgment and knowledge of mathematics; all calculations must be checked. The specific rubrics for each question must be applied consistently to all responses. In cases that are not specifically addressed in the rubrics, raters must follow the general rating guidelines in the publication *Information Booklet for Scoring the Regents Examination in Mathematics B*, use their own professional judgment, confer with other mathematics teachers, and/or contact the consultants at the State Education Department for guidance. During each Regents examination administration period, rating questions may be referred directly to the Education Department. The contact numbers are sent to all schools before each administration period.

II. Full-Credit Responses

A full-credit response provides a complete and correct answer to all parts of the question. Sufficient work is shown to enable the rater to determine how the student arrived at the correct answer.

When the rubric for the full-credit response includes one or more examples of an acceptable method for solving the question (usually introduced by the phrase "such as"), it does **not** mean that there are no additional acceptable methods of arriving at the correct answer. Unless otherwise specified, mathematically correct alternative solutions should be awarded credit. The only exceptions are those questions that specify the type of solution that must be used; e.g., an algebraic solution or a graphic solution. A correct solution using a method other than the one specified is awarded half the credit of a correct solution using the specified method.

III. Appropriate Work

Full-Credit Responses: The directions in the examination booklet for all the constructed-response questions state: "Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, charts, etc." The student has the responsibility of providing the correct answer **and** showing how that answer was obtained. The student must "construct" the response; the teacher should not have to search through a group of seemingly random calculations scribbled on the student paper to ascertain what method the student may have used.

Responses With Errors: Rubrics that state "Appropriate work is shown, but …" are intended to be used with solutions that show an essentially complete response to the question but contain certain types of errors, whether computational, rounding, graphing, or conceptual. If the response is incomplete, i.e., an equation is written but not solved or an equation is solved but not all of the parts of the question are answered, appropriate work has **not** been shown. Other rubrics address incomplete responses.

IV. Multiple Errors

Computational Errors, Graphing Errors, and Rounding Errors: Each of these types of errors results in a 1-credit deduction. Any combination of two of these types of errors results in a 2-credit deduction. No more than 2 credits should be deducted for such mechanical errors in any response. The teacher must carefully review the student's work to determine what errors were made and what type of errors they were.

Conceptual Errors: A conceptual error involves a more serious lack of knowledge or procedure. Examples of conceptual errors include using the incorrect formula for the area of a figure, choosing the incorrect trigonometric function, or multiplying the exponents instead of adding them when multiplying terms with exponents. A response with one conceptual error can receive no more than half credit.

If a response shows repeated occurrences of the same conceptual error, the student should not be penalized twice. If the same conceptual error is repeated in responses to other questions, credit should be deducted in each response.

If a response shows two (or more) different major conceptual errors, it should be considered completely incorrect and receive no credit.

If a response shows one conceptual error and one computational, graphing, or rounding error, the teacher must award credit that takes into account both errors: i.e., awarding half credit for the conceptual error and deducting 1 credit for each mechanical error (maximum of two deductions for mechanical errors).

Part II

For each question, use the specific criteria to award a maximum of two credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(21)   **[2]** $\dfrac{x+1}{x+4}$, and appropriate work is shown.

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

or

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

or

      [1] $\dfrac{x+1}{x+4}$, 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.

(22)   **[2]** 117.6, and appropriate work is shown.

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

or

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

or

      [1] 117.6, 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.

(23) **[2]** 19,683, and appropriate work is shown.

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

or

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

or

[1] 19,683, 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]** $2 < x < 5$ or an equivalent expression, and appropriate work is shown.

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

or

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

or

[1] $2 < x < 5$ or an equivalent expression, 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.

(25) **[2]** .83.

[1] One rounding error is made.

or

[1] One conceptual error is made, such as finding .88, the sample standard deviation.

[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]** 24, and appropriate work is shown.

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

or

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

or

[1] 24, 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. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(27)   **[4]** $y = -0.112x + 23.448$ and –5, and appropriate work is shown, such as substituting 255 into the regression equation.

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

or

[3] The expression $-0.112x + 23.448$ is written and –5, and appropriate work is shown.

or

[3] $y = -0.112x + 23.448$ and –5, but no work is shown.

[2] Appropriate work is shown, but two or more computational or rounding errors are made.

or

[2] Appropriate work is shown, but one conceptual error is made.

or

[2] An incorrect regression equation is written, but an appropriate temperature is found.

or

[2] $y = -0.112x + 23.448$, but no further correct work is shown.

or

[2] The expression $-0.112x + 23.448$ is written and –5, but no work is shown.

[1] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.

or

[1] The expression $-0.112x + 23.448$ is written, but no further correct work is shown.

or

[1] –5, 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]** −1, and appropriate work is shown.

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

or

[3] Appropriate work is shown to find $\dfrac{7x - 1}{1 - 7x}$, but no further correct work is shown.

[2] Appropriate work is shown, but two or more computational, factoring, or simplification errors are made.

or

[2] Appropriate work is shown, but one conceptual error is made.

or

[2] All numerators and denominators are factored correctly, but no further correct work is shown.

[1] Appropriate work is shown, but one conceptual error and one computational, factoring, or simplification error are made.

or

[1] −1, 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.

[OVER]

(29) **[4]** Both the circle and its image are drawn and labeled correctly, and the equation $(x + 2)^2 + (y - 1)^2 = 4$ is written.

[3] The circle and its image are drawn and labeled, but one graphing error is made, but an appropriate equation is written.

or

[3] The circle and its image are drawn and labeled correctly, but the equation is not written or is written incorrectly.

[2] The circle and its image are drawn and labeled, but two or more graphing errors are made, but an appropriate equation is written.

or

[2] The circle is drawn and labeled correctly, but one conceptual error is made in the composition, such as performing the translation before the reflection, but an appropriate equation is written.

or

[2] The circle is drawn incorrectly, but an appropriate image is drawn, and both are labeled, but the equation is not written or is written incorrectly.

[1] The circle and its image are drawn and labeled, but one conceptual error and one graphing error are made, but an appropriate equation is written.

or

[1] The circle is drawn and labeled correctly, but no further correct 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.

(30)   **[4]** 3.71 and 4.71, and appropriate work is shown.

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

or

[3] The correct equation is solved for x, but the negative root is not rejected or the second leg is not found.

[2] Appropriate work is shown, but two or more computational or rounding errors are made.

or

[2] Appropriate work is shown, but one conceptual error is made.

or

[2] The correct equation is solved for x, but the negative root is not rejected, and the second leg is not found.

[1] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.

or

[1] $2x^2 + 2x - 35 = 0$ is written, but no further correct work is shown.

or

[1] 3.71 and 4.71, but no work is shown.

[0] 3.71 or 4.71, but 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.

[OVER]

(31) **[4]** A complete and correct proof that includes a concluding statement that *ABCD* is a parallelogram and not a rhombus is written.

[3] Appropriate work is shown, but one computational or graphing error is made, but an appropriate conclusion is written.

[2] Appropriate work is shown, but two or more computational or graphing errors are made, but an appropriate conclusion is written.

or

[2] Appropriate work is shown, but one conceptual error is made, but an appropriate conclusion is written.

or

[2] *ABCD* is proven to be a parallelogram, but no further correct work is shown.

or

[2] *ABCD* is proven not to be a rhombus, but no further correct work is shown.

or

[2] The correct calculations necessary to prove that *ABCD* is a parallelogram and *ABCD* is not a rhombus are performed, but a concluding statement is not written or is written incorrectly.

[1] Appropriate work is shown, but one conceptual error and one computational or graphing error are made, but an appropriate conclusion is written.

or

[1] The correct calculations necessary to prove that *ABCD* is a parallelogram are performed, but no further correct work is shown.

or

[1] The correct calculations necessary to prove that *ABCD* is not a rhombus are performed, but no further correct 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]** $x = 5$, $y = -1$, and $x = -19$, $y = -13$ or $(5,-1)$ and $(-19,-13)$, and appropriate algebraic work is shown.

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

or

[3] Appropriate work is shown, but the solutions are not labeled or are labeled incorrectly.

or

[3] Appropriate work is shown, but only one correct solution is found or only the x- or the y-values are found correctly.

[2] Appropriate work is shown, but two or more computational or factoring errors are made.

or

[2] Appropriate work is shown, but one conceptual error is made.

or

[2] The correct answers are stated, but a method other than algebraic is used.

or

[2] A correct quadratic equation set equal to zero is written, but no further correct work is shown.

[1] Appropriate work is shown, but one conceptual error and one computational or factoring error are made.

or

[1] A correct quadratic equation in one variable is written, but no further correct work is shown.

or

[1] $x = 5$, $y = -1$, and $x = -19$, $y = -13$, but no work is shown.

[0] $x = 5$, $y = -1$, or $x = -19$, $y = -13$, but 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.

Part IV

For each question, use the specific criteria to award a maximum of six credits. Unless otherwise specified, mathematically correct alternative solutions should be awarded appropriate credit.

(33) **[6]** 42.8 and 77, and appropriate work is shown.

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

[4] Appropriate work is shown, but two or more computational or rounding errors are made.

or

[4] Appropriate work is shown, but one conceptual error is made.

[3] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.

or

[3] Appropriate work is shown to find 42.8, but no further correct work is shown.

[2] Appropriate work is shown, but two conceptual errors are made.

or

[2] 42.8 and 77, but no work is shown.

[1] Appropriate work is shown, but two conceptual errors and one computational or rounding error are made.

or

[1] A correct substitution is made into the Law of Cosines, but no further correct work is shown.

or

[1] 42.8, 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.

(34)   **[6]** 19, 90, and 161, and appropriate algebraic work is shown.

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

or

[5] Appropriate work is shown, but only two answers are found.

[4] Appropriate work is shown, but two or more computational errors are made.

or

[4] Appropriate work is shown to find either 19 or 90, but no further correct work is shown.

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

or

[3] Appropriate work is shown to find $(\sin \theta - 1)(3 \sin \theta - 1) = 0$, but no further correct work is shown.

or

[3] 19, 90, and 161, but a method other than algebraic is used.

[2] Appropriate work is shown, but one conceptual error and one computational error are made.

or

[2] A correct quadratic equation in standard form (set equal to zero) in terms of sine is written, but no further correct work is shown.

[1] A correct quadratic equation in terms of sine is written, but no further correct work is shown.

or

[1] 19, 90, and 161, but no work is shown.

[0] 19 or 90 or 161, but 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.

Map to Learning Standards

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

Regents Examination in Mathematics B

June 2010

Chart for Converting Total Test Raw Scores to
Final Examination Scores (Scale Scores)

The *Chart for Determining the Final Examination Score for the June 2010 Regents Examination in Mathematics B* will be posted on the Department's web site **http://www.emsc.nysed.gov/osa/** on **Tuesday, June 15, 2010.** Conversion charts provided for the previous administrations of the Regents Examination in Mathematics B must NOT be used to determine students' final scores for this administration.

Online Submission of Teacher Evaluations of the Test to the Department

Suggestions and feedback from teachers provide an important contribution to the test development process. The Department provides an online evaluation form for State assessments. It contains spaces for teachers to respond to several specific questions and to make suggestions. Instructions for completing the evaluation form are as follows:

1. Go to http://www.emsc.nysed.gov/osa/exameval.

2. Select the test title.

3. Complete the required demographic fields.

4. Complete each evaluation question and provide comments in the space provided.

5. Click the SUBMIT button at the bottom of the page to submit the completed form.

As a reminder . . .
   Regents examinations based on the Mathematics B syllabus will not be offered after June 2010.

Regents Examination in Mathematics B
June 2010

**Chart for Converting Total Test Raw Scores to
Final Examination Scores (Scale Scores)**

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

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 scale score that corresponds to that raw score. The scale score is the student's final examination score. Enter this score in the space labeled "Scale Score" on the student's answer sheet.

All student answer papers that receive a scale score of 60 through 64 **must** be scored a second time to ensure the accuracy of the score. 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.

Because scale scores corresponding to raw scores in the conversion chart change from one examination to another, it is crucial that for each administration, the conversion chart provided for that administration be used to determine the student's final score. The chart above is usable only for this administration of the Regents Examination in Mathematics B.