The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS B

Thursday, June 15, 2006 — 1:15 to 4:15 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.

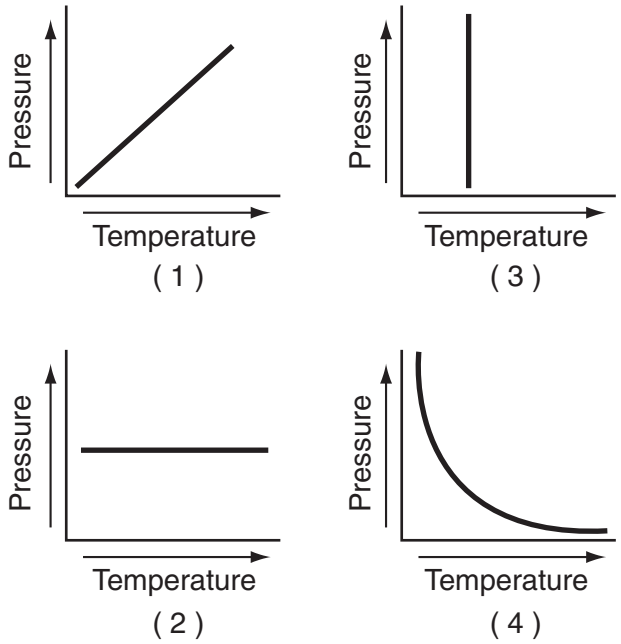
DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

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 Each graph below represents a possible relationship between temperature and pressure. Which graph does *not* represent a function?

Use this space for computations.

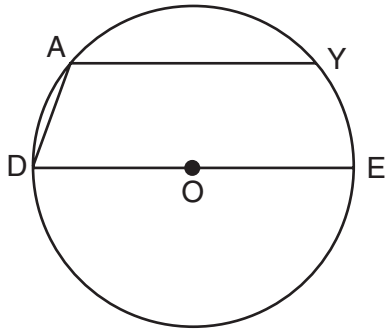


2 If $f(x) = x^{-\frac{3}{2}}$, then $f\left(\frac{1}{4}\right)$ is equal to

(1) 8
(2) –2
(3) $-\frac{1}{8}$
(4) –4

Use this space for computations.

3 In the accompanying diagram of circle O, chord $\overline{AY}$ is parallel to diameter $\overline{DOE}$, $\overline{AD}$ is drawn, and $m\overset{\frown}{AD} = 40$.



What is $m\angle DAY$?

(1) 90
(2) 110
(3) 130
(4) 150

4 If x is a positive acute angle and $\sin x = \frac{1}{2}$, what is $\sin 2x$?

(1) $-\frac{1}{2}$
(2) $\frac{1}{2}$
(3) $-\frac{\sqrt{3}}{2}$
(4) $\frac{\sqrt{3}}{2}$

5 The temperature generated by an electrical circuit is represented by $t = f(m) = 0.3m^2$, where m is the number of moving parts. The resistance of the same circuit is represented by $r = g(t) = 150 + 5t$, where t is the temperature. What is the resistance in a circuit that has four moving parts?

(1) 51
(2) 156
(3) 174
(4) 8,670

6 If the equation $x^2 - kx - 36 = 0$ has $x = 12$ as one root, what is the value of k?

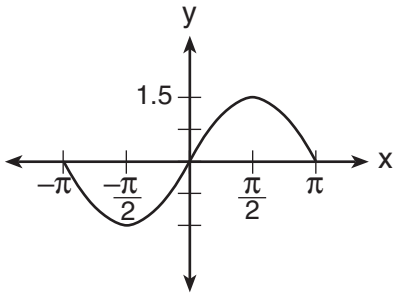
(1) 9
(2) –9
(3) 3
(4) –3

Use this space for computations.

7 The height, f(x), of a bouncing ball after x bounces is represented by f(x) = $80(0.5)^x$. How many times higher is the first bounce than the fourth bounce?

(1) 8
(2) 2
(3) 16
(4) 4

8 A radio transmitter sends a radio wave from the top of a 50-foot tower. The wave is represented by the accompanying graph.



What is the equation of this radio wave?

(1) $y = \sin x$
(2) $y = 1.5 \sin x$
(3) $y = \sin 1.5x$
(4) $y = 2 \sin x$

9 If $\tan \theta = 2.7$ and $\csc \theta < 0$, in which quadrant does θ lie?

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

10 The expression $\frac{1 - \cos^2 x}{\sin^2 x}$ is equivalent to

(1) 1
(2) –1
(3) $\sin x$
(4) $\cos x$

11 The graph of $y = (x - 3)^2$ is shifted left 4 units and down 2 units. What is the axis of symmetry of the transformed graph?

(1) $x = -2$
(2) $x = -1$
(3) $x = 1$
(4) $x = 7$

12 The solution set of $2^{x^2+2x} = 2^{-1}$ is

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

Use this space for computations.

13 Which transformation best describes the relationship between the functions $f(x) = 2^x$ and $g(x) = \left(\frac{1}{2}\right)^x$?

(1) reflection in the line $y = x$
(2) reflection in the origin
(3) reflection in the x-axis
(4) reflection in the y-axis

14 What is the multiplicative inverse of $3i$?

(1) $-3i$
(2) -3
(3) $\frac{1}{3}$
(4) $-\frac{i}{3}$

15 Mrs. Donahue made up a game to help her class learn about imaginary numbers. The winner will be the student whose expression is equivalent to $-i$. Which expression will win the game?

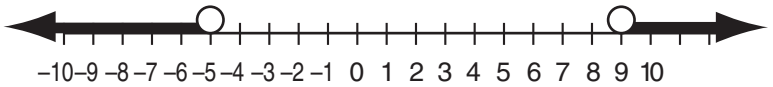
(1) i^{46}
(2) i^{47}
(3) i^{48}
(4) i^{49}

16 Which equation represents a hyperbola?

(1) $y^2 = 16 - x^2$
(2) $y = 16 - x^2$
(3) $y = 16x^2$
(4) $y = \frac{16}{x}$

17 The solution set of which inequality is represented by the accompanying graph?

Use this space for computations.



(1) $|x - 2| > 7$
(2) $|x - 2| < 7$
(3) $|2 - x| > -7$
(4) $|2 - x| < -7$

18 According to Boyle's Law, the pressure, p, of a compressed gas is inversely proportional to the volume, v. If a pressure of 20 pounds per square inch exists when the volume of the gas is 500 cubic inches, what is the pressure when the gas is compressed to 400 cubic inches?

(1) 16 lb/in^2
(2) 25 lb/in^2
(3) 40 lb/in^2
(4) 50 lb/in^2

19 What is the fourth term in the expansion of $(y - 1)^7$?

(1) $35y^4$
(2) $35y^3$
(3) $-35y^4$
(4) $-35y^3$

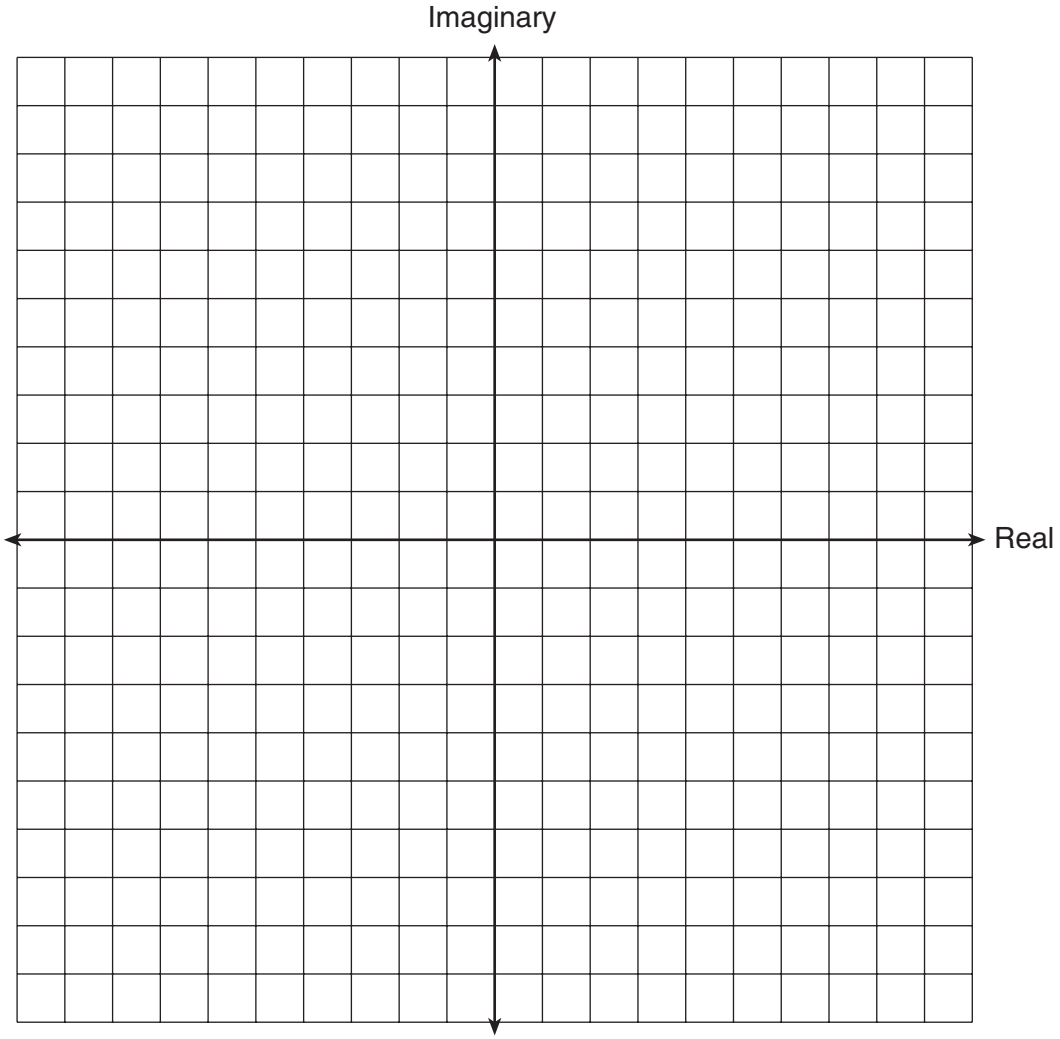
20 Sam needs to cut a triangle out of a sheet of paper. The only requirements that Sam must follow are that one of the angles must be 60°, the side opposite the 60° angle must be 40 centimeters, and one of the other sides must be 15 centimeters. How many different triangles can Sam make?

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

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 Find the sum of $-2 + 3i$ and $-1 - 2i$.
Graph the resultant on the accompanying set of axes.



22 In $\triangle ABC$, $m\angle A = 53$, $m\angle B = 14$, and $a = 10$. Find b to the *nearest integer.*

23 Solve for x: $\log_2 (x + 1) = 3$

24 Evaluate: $\sum_{k=1}^{2} \frac{(-1)^{k-1}}{(2k-1)!}$

25 Ginger and Mary Anne are planning a vacation trip to the island of Capri, where the probability of rain on any day is 0.3. What is the probability that during their five days on the island, they have *no* rain on *exactly* three of the five days?

26 The pendulum of a clock swings through an angle of 2.5 radians as its tip travels through an arc of 50 centimeters. Find the length of the pendulum, in centimeters.

Part III

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 Solve the following system of equations algebraically:

$$9x^2 + y^2 = 9$$
$$3x - y = 3$$

28 Simplify for all values of a for which the expression is defined: $\dfrac{1-\frac{2}{a}}{\frac{4}{a^2}-1}$

29 Solve algebraically for x: $\sqrt{3x+1}+1=x$

30 The number of children of each of the first 41 United States presidents is given in the accompanying table. For this population, determine the mean and the standard deviation to the *nearest tenth*.

How many of these presidents fall within one standard deviation of the mean?

Number of Children (x_i)	**Number of Presidents** (f_i)
0	6
1	2
2	8
3	6
4	7
5	3
6	5
7	1
8	1
10	1
15	1

31 A factory is producing and stockpiling metal sheets to be shipped to an automobile manufacturing plant. The factory ships only when there is a minimum of 2,050 sheets in stock. The accompanying table shows the day, x, and the number of sheets in stock, $f(x)$.

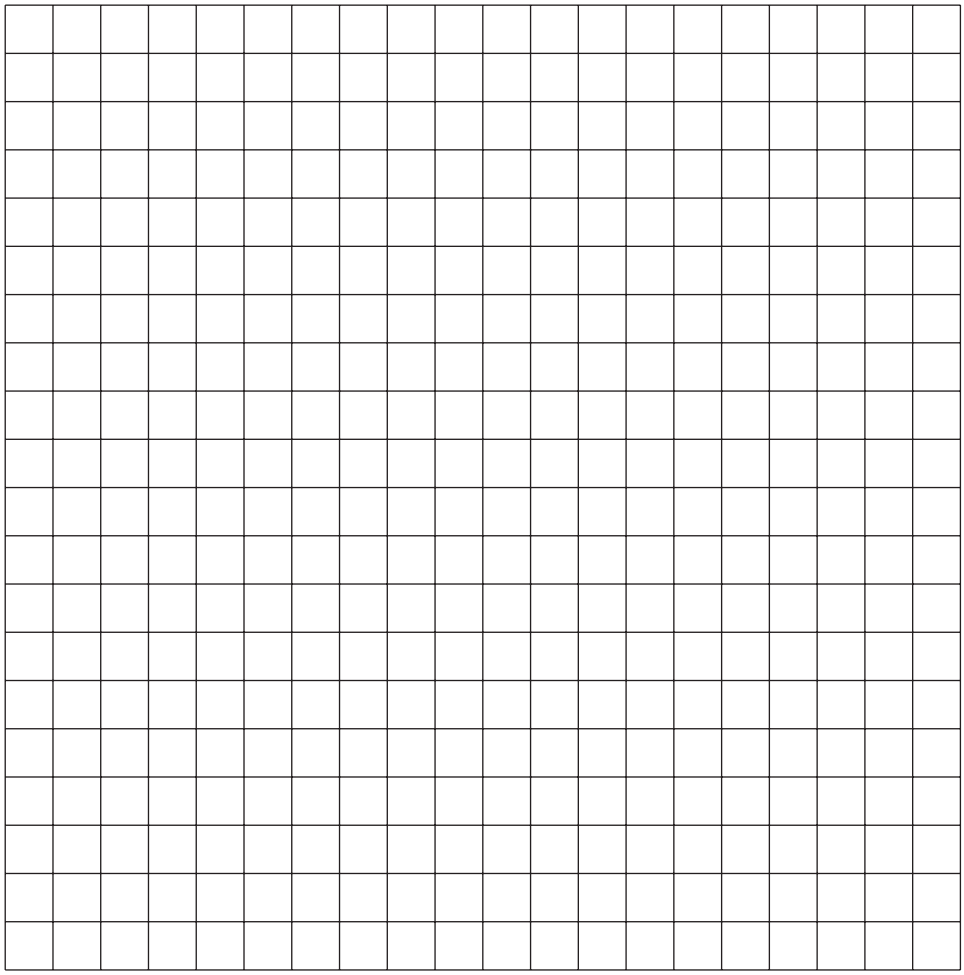
Day (x)	**Sheets in Stock** ($f(x)$)
1	860
2	930
3	1000
4	1150
5	1200
6	1360

Write the linear regression equation for this set of data, rounding the coefficients to *four decimal places*.

Use this equation to determine the day the sheets will be shipped.

32 A small rocket is launched from a height of 72 feet. The height of the rocket in feet, h, is represented by the equation $h(t) = -16t^2 + 64t + 72$, where t = time, in seconds. Graph this equation on the accompanying grid.

Use your graph to determine the number of seconds that the rocket will remain at or above 100 feet from the ground. [Only a graphic solution can receive full credit.]



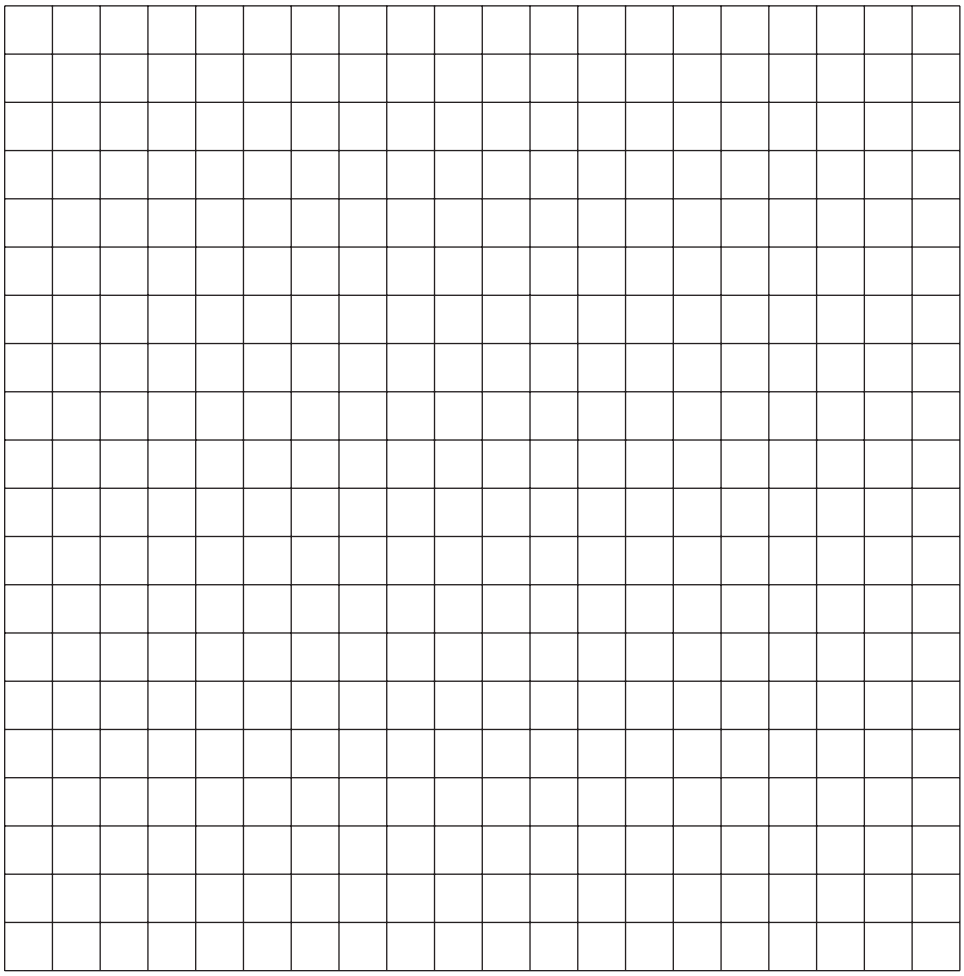
Part IV

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 Given: $A(-2,2)$, $B(6,5)$, $C(4,0)$, $D(-4,-3)$

Prove: $ABCD$ is a parallelogram but not a rectangle. [The use of the grid on the next page is optional.]

Question 33 continued



34 A triangular plot of land has sides that measure 5 meters, 7 meters, and 10 meters. What is the area of this plot of land, to the *nearest tenth of a square meter*?

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Formulas

Area of Triangle

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

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

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

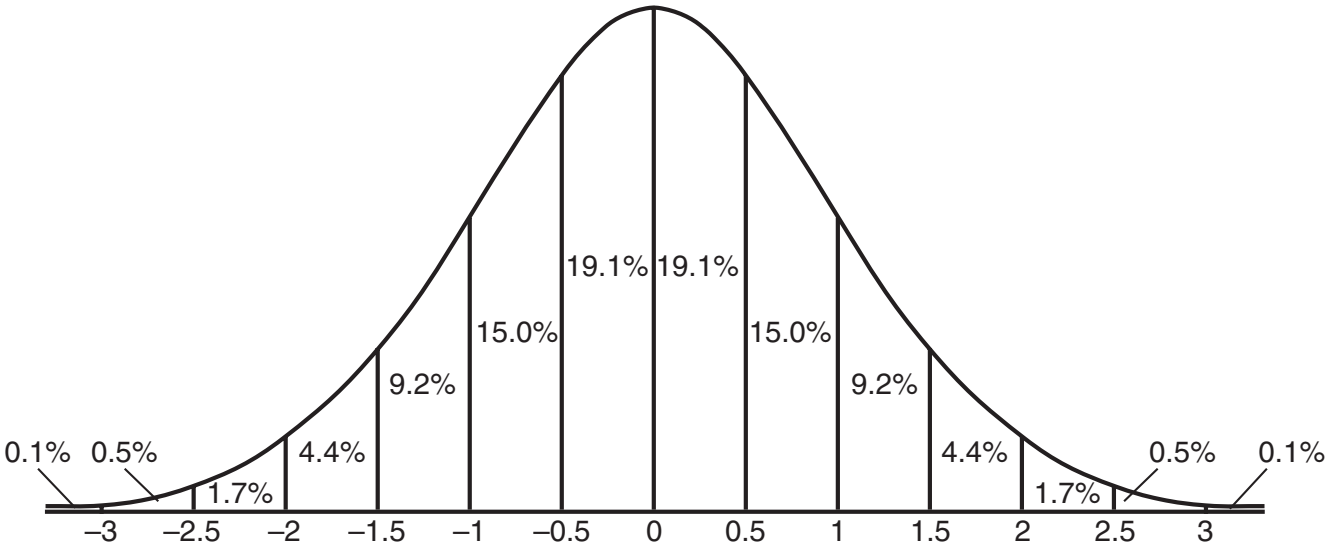
Functions of the Half Angle

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

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

Normal Curve

Standard Deviation



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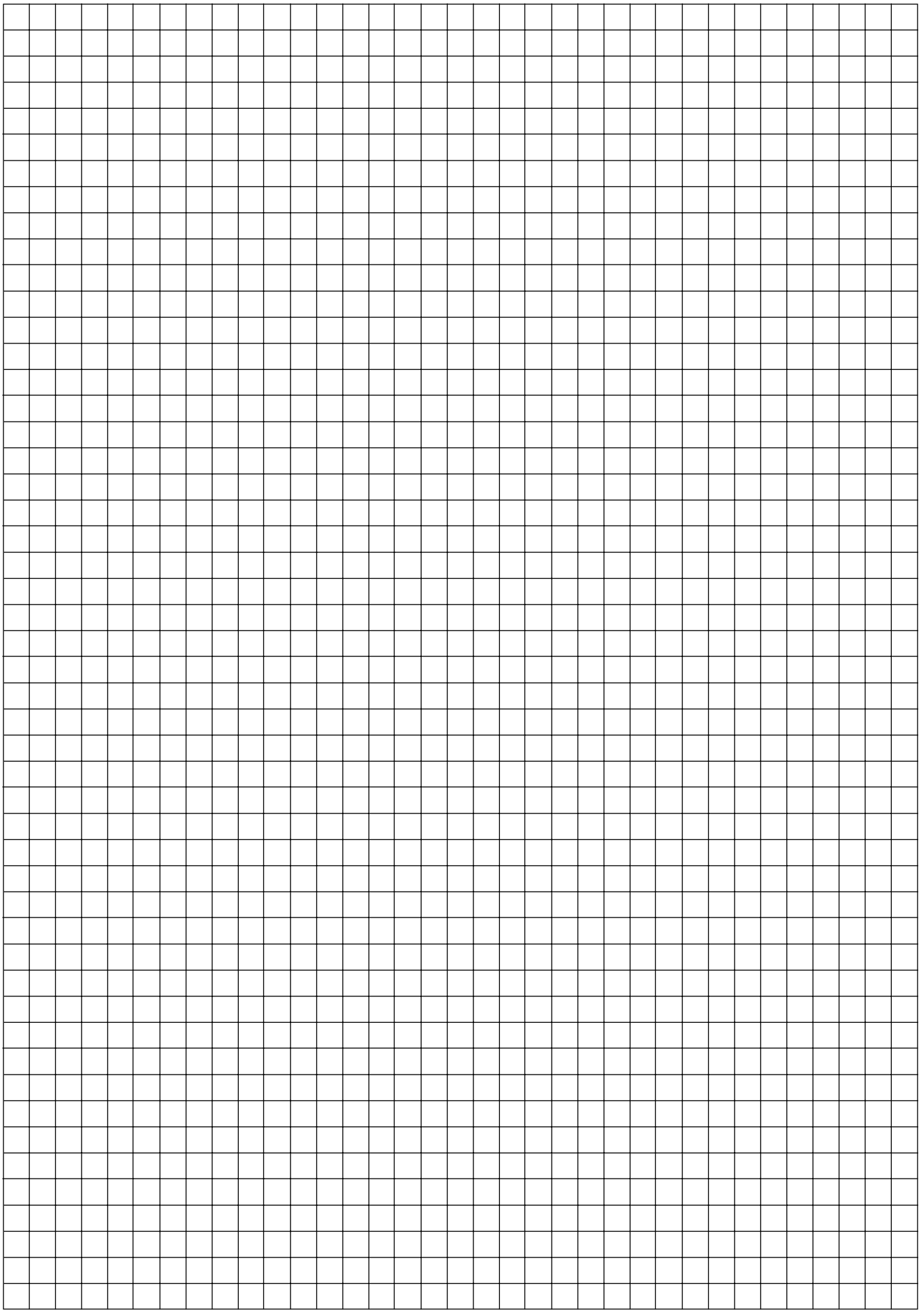
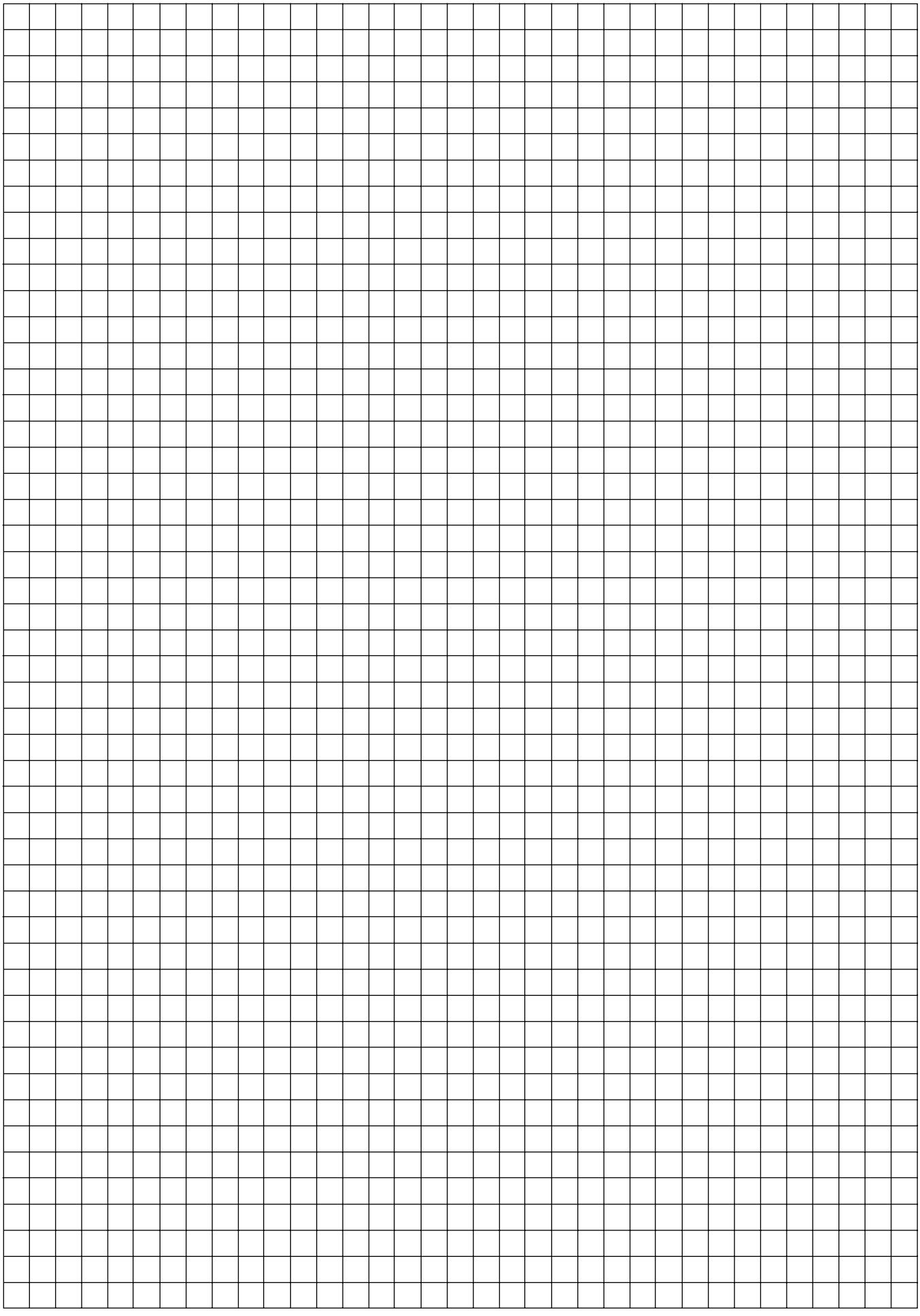
Scrap Graph Paper — This sheet will *not* be scored.



Scrap Graph Paper — This sheet will *not* be scored.



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The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS B

Thursday, June 15, 2006 — 1:15 to 4:15 p.m., only

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 should 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

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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**		

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

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

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MATHEMATICS B

FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS B

Thursday, June 15, 2006 — 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 B examination. More detailed information about scoring is provided in the publication *Information Booklet for Scoring the Regents Examinations in Mathematics A and 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 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'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 scaled score by using the conversion chart that will be posted on the Department's web site http://www.emsc.nysed.gov/osa/ on Thursday, June 15, 2006. 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) 1	(11) 2	(16) 4
(2) 1	(7) 1	(12) 2	(17) 1
(3) 2	(8) 2	(13) 4	(18) 2
(4) 4	(9) 3	(14) 4	(19) 3
(5) 3	(10) 1	(15) 2	(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 Examinations in Mathematics A and 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 Examinations in Mathematics A and 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]** $-3 + i$, and an appropriate graph is drawn.

[1] The sum is found incorrectly, but an appropriate graph is drawn.

or

[1] $-3 + i$, but no graph or an incorrect graph is drawn.

[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]** 3, and appropriate work is shown, such as $\frac{10}{\sin 53^\circ} = \frac{b}{\sin 14^\circ}$.

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

or

[1] The proportion $\frac{10}{\sin 53^\circ} = \frac{b}{\sin 14^\circ}$ is written, but no further correct work is shown.

or

[1] An incorrect proportion of equal difficulty is solved appropriately.

or

[1] 3, 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]** 7, and appropriate work is shown, such as $2^3 = x + 1$.

[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] $2^3 = x + 1$ is written, but no further correct work is shown.

or

[1] 7, 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]** $\frac{5}{6}$ or $0.8\overline{3}$, and appropriate work is shown.

[1] Appropriate work is shown, but one computational or rounding error is made, such as representing $\frac{5}{6}$ as a terminating decimal.

or

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

or

[1] $\frac{5}{6}$ or $0.8\overline{3}$, 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]** .3087 or an equivalent answer, 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, such as evaluating ${}_5C_3(0.3)^3(0.7)^2$.

or

[1] .3087 or an equivalent answer, 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.

(26) **[2]** 20, and appropriate work is shown, such as using the formula $S = r\theta$.

[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] 20, 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.

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[5]

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]** (0,–3) and (1,0) or an equivalent answer, and appropriate algebraic work is shown.

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

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 errors are made.

or

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

or

[2] (0,–3) and (1,0), but a method other than an algebraic solution is used.

or

[2] A correct quadratic equation is written in standard form, such as $18x^2 - 18x = 0$, but no further correct work is shown.

or

[2] An incorrect quadratic equation of equal difficulty is solved appropriately.

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

or

[1] An incorrect equation of a lesser degree of difficulty is solved appropriately.

or

[1] $y = 3x - 3$ is found and substituted into the second equation, but no further correct work is shown.

or

[1] (0,–3) and (1,0), but no work is shown.

[0] Only one correct solution is found or only the x- or the y-values are found correctly, 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.

(28) **[4]** $\frac{-a}{2+a}$ or $\frac{a}{-2-a}$, and appropriate work is shown.

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

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

or

[2] Appropriate work is shown, but one conceptual error is made, such as not recognizing that –1 is a factor.

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

or

[1] $\frac{-a}{2+a}$ or $\frac{a}{-2-a}$, 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.

(29) **[4]** 5, and appropriate algebraic work is shown.

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

or

[3] 5 and 0, and appropriate work is shown, but the zero is not rejected.

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

or

[2] Appropriate work is shown, but one conceptual error is made, such as squaring $x - 1$ incorrectly.

or

[2] 5, but a method other than an algebraic solution is used, such as graphing or trial and error with at least three trials and appropriate checks.

or

[2] A correct quadratic equation is written in standard form, such as $0 = x^2 - 5x$, but no further correct work is shown.

or

[2] An incorrect quadratic equation of equal difficulty is solved appropriately.

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

or

[1] An incorrect equation of a lesser degree of difficulty is solved appropriately.

or

[1] 5, but no work is shown.

[0] 5 and 0, 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.

(30) **[4]** Mean = 3.6, standard deviation = 2.9, and 31, and appropriate work is shown, such as an explanation of how the solutions were found.

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

or

[3] The mean and standard deviation are calculated correctly and appropriate work is shown, but the number of presidents in the specified interval is found incorrectly.

[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, such as using the sample standard deviation.

or

[2] The mean and standard deviation are calculated correctly, but the number of presidents is not found.

or

[2] The mean and standard deviation are calculated incorrectly, but an appropriate number of presidents is found.

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

or

[1] Mean = 3.6, standard deviation = 2.9, and 31, but no work is shown.

[0] Mean = 3.6 *or* standard deviation = 2.9 *or* 31, 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.

(31) **[4]** f(x) = 98.8571x + 737.3333 or y = 98.8571x + 737.3333 and day 14, and appropriate substitution is made, such as 2050 = 98.8571x + 737.3333.

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

or

[3] A correct linear regression equation is written and day 14, but no substitution is made.

or

[3] The expression 98.8571x + 737.3333 is written and day 14, and appropriate substitution is made, but no equation is written.

[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] A correct linear regression equation is written, but no further correct work is shown.

or

[2] An incorrect equation of equal difficulty is solved appropriately.

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

or

[1] The expression 98.8571x + 737.3333 is written, but no further correct work is shown.

or

[1] Day 14, 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.

(32) **[4]** A correct graph is drawn, and 3.

[3] 3, and appropriate work is shown, but one graphing error is made.

or

[3] A correct graph is drawn and the points 0.5 and 3.5 are identified, but the difference is not calculated.

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

or

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

or

[2] 3, but a method other than a graphic solution is used.

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

or

[1] A correct graph is sketched with $t = 0$ to $t = 4$, but no further correct work is shown.

or

[1] 3, but no work is shown and no graph is drawn.

[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]** Appropriate work is shown, such as using slopes to prove *ABCD* is a parallelogram but not a rectangle, and an appropriate concluding statement is made.

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

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

or

[4] Appropriate work is shown, but one conceptual error is made, such as using an incorrect formula.

or

[4] A proof is written that correctly shows either *ABCD* is a parallelogram or it is not a rectangle, but not both.

[3] Appropriate work is shown, but two or more computational or graphing errors are made, and the concluding statement is incomplete.

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

or

[2] All four slopes are found correctly or the lengths of all four sides are found correctly, and appropriate work is shown, but no further correct work is shown.

[1] The slopes of all four sides are identified or the lengths of all four lines are identified, but no work is shown and no proof is written.

[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]** 16.2, and appropriate work is shown, such as using the Law of Cosines to find one angle, and then using $K = \frac{1}{2}ab \sin C$ or Hero(n)'s formula, $A = \sqrt{s(s-a)(s-b)(s-c)}$, to find the area.

[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.

[3] Appropriate work is shown, but one conceptual error is made, but an appropriate area is found.

or

[3] The Law of Cosines is used to find a correct measure for one of the angles of the triangle, but no further correct work is shown.

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

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

or

[1] 16.2, but no work is shown.

[0] Right triangle trigonometry is used inappropriately.

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

Regents Examination in Mathematics B

June 2006

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

The *Chart for Determining the Final Examination Score for the June 2006 Regents Examination in Mathematics B* will be posted on the Department's web site http://www.emsc.nysed.gov/osa/ on Thursday, June 15, 2006. Conversion charts provided for previous administrations of the Mathematics B examination must NOT be used to determine students' final scores for this administration.

The *Teacher Evaluation of State Examinations* forms will also be posted on the same web site. Please select the link "Teacher Evaluation Forms" and then the examination title to complete the evaluation form for the *June 2006 Regents Examination in Mathematics B*.

University of the State of New York
State Education Department

Regents Examination in Mathematics B
June 2006

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

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 only the conversion chart provided for that administration be used to determine the student's final score. The chart above is usable only for the June 2006 administration of the Mathematics B Examination.