The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS B

Tuesday, January 26, 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]

Use this space for computations.

1 If $\sqrt{x-4} = 7$, what is the value of x?

(1) 11
(2) 18
(3) 45
(4) 53

2 The coordinates of $\triangle ABC$ are $A(1,1)$, $B(2,3)$, and $C(3,1)$. If $\triangle A'B'C'$ is the result of the transformation $D_2 \circ r_{y\text{-axis}}$, then $\triangle A'B'C'$ is

(1) similar to $\triangle ABC$
(2) congruent to $\triangle ABC$
(3) a right triangle
(4) an equilateral triangle

3 What is the value of $3\sum_{n=2}^{6} \frac{n}{2}$?

(1) 10
(2) 13
(3) 30
(4) 60

4 An equation of a parabola that has $x = -2$ as its axis of symmetry is

(1) $y = x^2 - 4x + 1$
(2) $y = x^2 - 2x + 3$
(3) $y = 2x^2 + 8x - 3$
(4) $y = 2x^2 + 4x - 7$

5 What is the solution set for the equation $|3 - 2x| = 5$?

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

6 A central angle of $\frac{4\pi}{15}$ radians intercepts an arc whose degree measure is

(1) 48
(2) 72
(3) 96
(4) $\frac{4\pi}{15}$

Use this space for computations.

7 If $\cos 2\theta = 1$, a value of θ is

(1) 45°
(2) 90°
(3) 180°
(4) 270°

8 If $\cos x = -0.7$ and $\csc x > 0$, the terminal side of angle x is located in Quadrant

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

9 The graph of the equation $xy = 12$ is best described as

(1) a circle
(2) two lines
(3) an ellipse
(4) a hyperbola

10 The image of function f(x) is found by mapping each point on the function (x,y) to the point (y,x). This image is a reflection of f(x) in

(1) the x-axis
(2) the y-axis
(3) the line whose equation is $y = x$
(4) the line whose equation is $y = -x$

11 What is the inverse of the function $y = 3x - 2$?

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

12 Which equation represents the circle whose center is (3,–1) and whose radius is $\sqrt{6}$?

(1) $(x + 3)^2 + (y - 1)^2 = 36$
(2) $(x - 3)^2 + (y + 1)^2 = 36$
(3) $(x + 3)^2 + (y - 1)^2 = 6$
(4) $(x - 3)^2 + (y + 1)^2 = 6$

Use this space for computations.

13 Which expression is equivalent to $\frac{y - x}{x^2 - y^2}$?

(1) $\frac{1}{x - y}$

(2) $\frac{-1}{x - y}$

(3) $\frac{1}{x + y}$

(4) $\frac{-1}{x + y}$

14 If $\log x = 3 \log a - \log b$, then x is equal to

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

(2) $\frac{a^3}{b}$

(3) $3a - b$

(4) $a^3 - b$

15 Which expression is equivalent to b in the equation $V = \sqrt{a^4 b^{\frac{1}{3}}}$?

(1) $\frac{V^6}{a^{12}}$

(2) $\frac{V^5}{a^7}$

(3) $\frac{V^2}{a^4}$

(4) $\frac{V}{a^2}$

16 In the binomial expansion of $(x + y)^8$, what is the coefficient of the term containing x^3y^5?

(1) 15

(2) 28

(3) 56

(4) 70

17 If R is inversely proportional to A, and $R = 4$ when $A = 100$, what is the value of R when $A = 250$?

(1) 0.625

(2) 1.6

(3) 10

(4) 6,250

Use this space for computations.

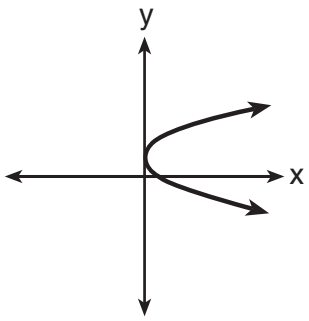
18 If m$\angle A$ = 35, b = 3, and a = 4, how many different triangles can be constructed?

(1) No triangles can be constructed.
(2) two triangles
(3) one right triangle, only
(4) one obtuse triangle, only

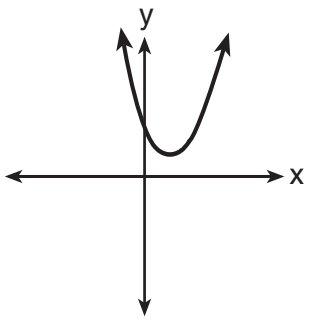
19 In a right triangle where one of the angles measures 30°, what is the ratio of the length of the side opposite the 30° angle to the length of the side opposite the 90° angle?

(1) $1:\sqrt{2}$
(2) 1:2
(3) 1:3
(4) $1:\sqrt{3}$

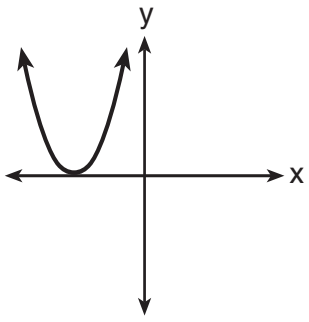
20 If zero is the value of the discriminant of the equation $ax^2 + bx + c = 0$, which graph best represents $y = ax^2 + bx + c$?



(1)



(3)



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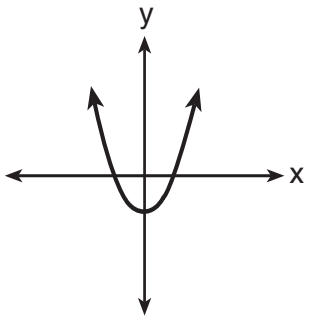


(4)

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]

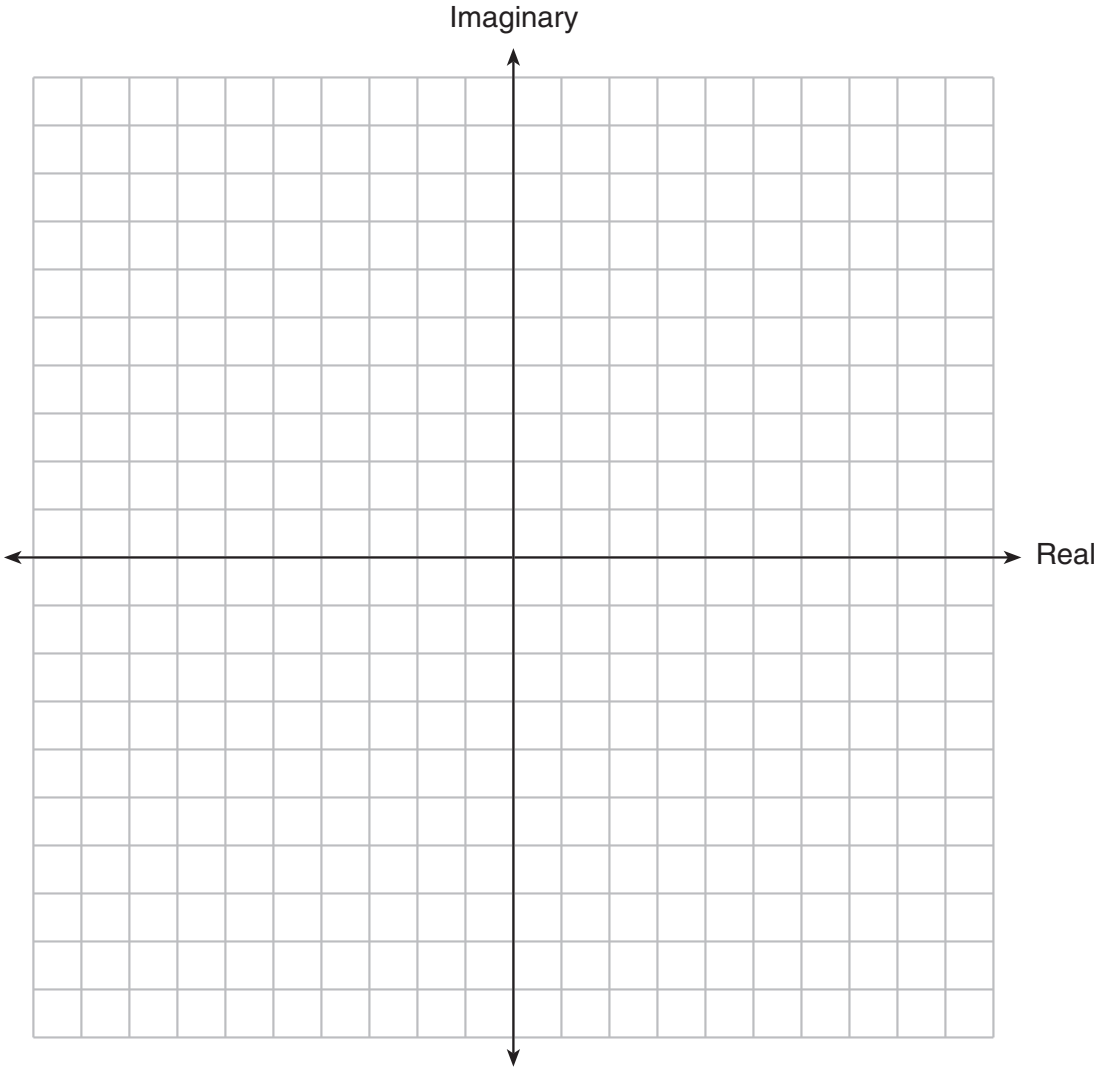
21 If $f(x) = 3x + 1$ and $g(x) = x^2 - 1$, find $(f \circ g)(2)$.

22 In $\triangle BAT$ and $\triangle CRE$, $\angle A \cong \angle R$ and $\overline{BA} \cong \overline{CR}$.

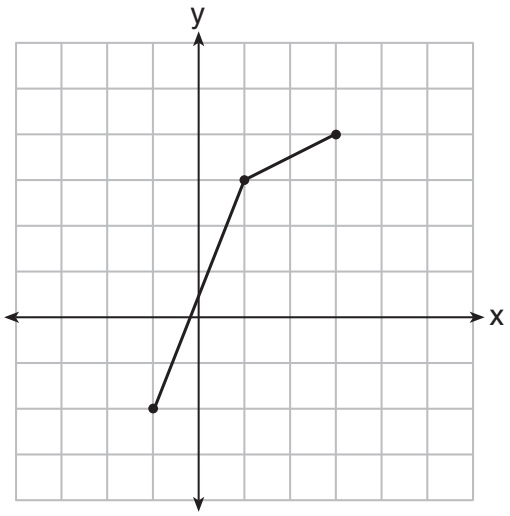
Write *one* additional statement that could be used to prove that the two triangles are congruent.

State the method that would be used to prove that the triangles are congruent.

23 Given the complex numbers $z_1 = 3 + 2i$ and $z_2 = -5 + 5i$. Find $z_1 - z_2$ and graph the result on the accompanying set of axes.



24 The function, f, is drawn on the accompanying set of axes. On the same set of axes, sketch the graph of f^{-1}, the inverse of f.



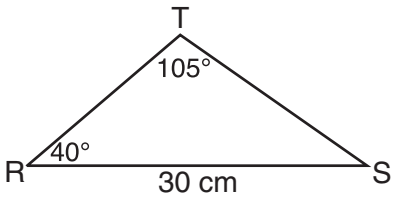
25 Express the sum of $4\sqrt{-12}$ and $3\sqrt{-27}$ in simplest radical form, in terms of i.

26 Express the reciprocal of $3 - \sqrt{7}$ in simplest radical form with a rational denominator.

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 In the accompanying diagram of $\triangle RST$, $RS = 30$ centimeters, $m\angle T = 105$, and $m\angle R = 40$. Find the area of $\triangle RST$, to the *nearest square centimeter.*



28 The mid-September statewide average gas prices, in dollars per gallon, (y), for the years since 2000, (x), are given in the table below.

Year Since 2000 (x)	**Price Per Gallon** (y)
1	1.345
2	1.408
3	1.537
4	1.58

Write a linear regression equation for this set of data.

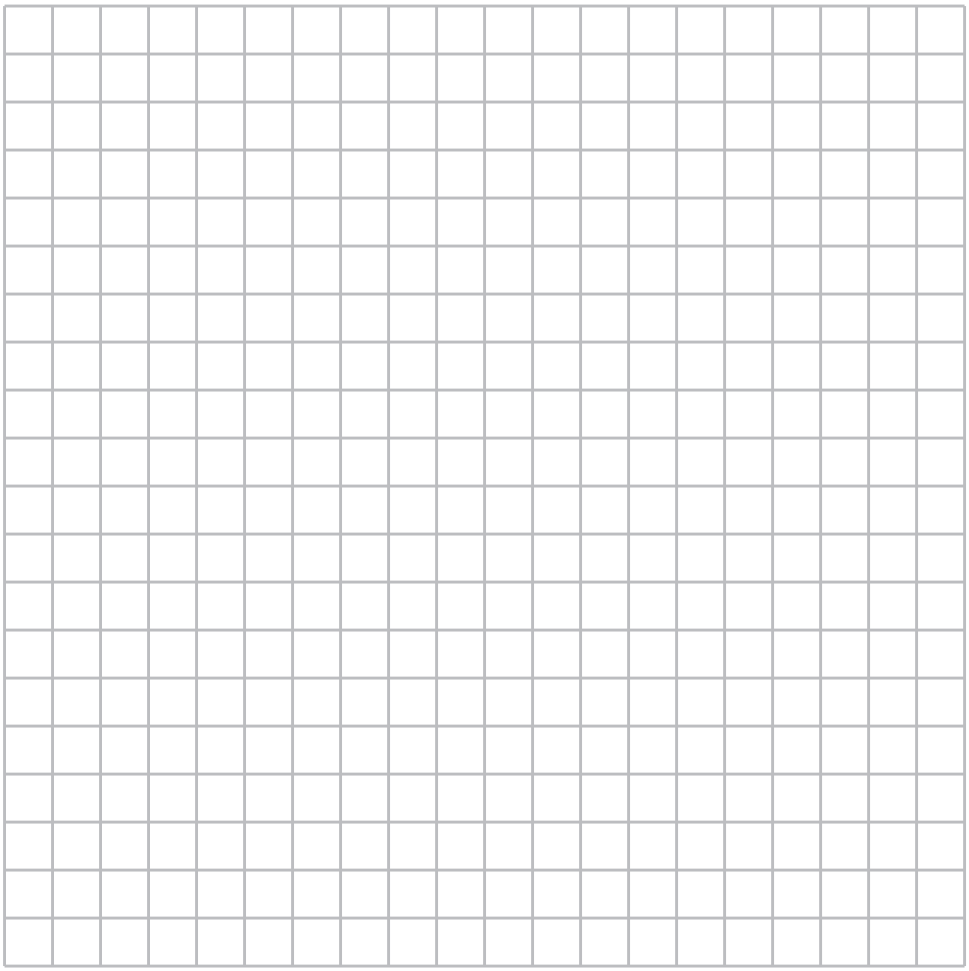
Using this equation, determine how much *more* the actual 2005 gas price was than the predicted gas price if the actual mid-September gas price for the year 2005 was $2.956.

29 Given: $J(-4,1)$, $E(-2,-3)$, $N(2,-1)$

Prove: $\triangle JEN$ is an isosceles right triangle.

[The use of the grid on the next page is optional.]

Question 29 continued



30 According to a federal agency, when a lie detector test is given to a truthful person, the probability that the test will show that the person is not telling the truth is 20%. If a company interviews five truthful candidates for a job and asks about thefts from prior employers, what is the probability a lie detector test will show that *at most* one candidate is *not* telling the truth?

31 Currently, the population of the metropolitan Waterville area is 62,700 and is increasing at an annual rate of 3.25%. This situation can be modeled by the equation $P(t) = 62{,}700(1.0325)^t$, where $P(t)$ represents the total population and t represents the number of years from now.

Find the population of the Waterville area, to the *nearest hundred*, seven years from now.

Determine how many years, to the *nearest tenth*, it will take for the original population to reach 100,000.

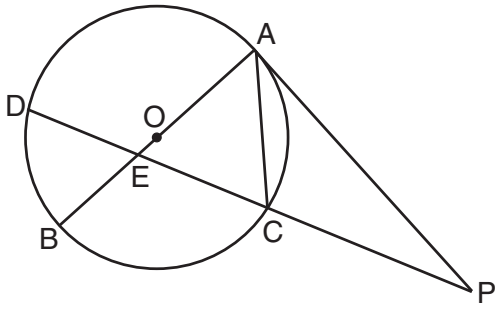
[Only an algebraic solution can receive full credit.]

32 A tractor stuck in the mud is being pulled out by two trucks. One truck applies a force of 1,200 pounds, and the other truck applies a force of 1,700 pounds. The angle between the forces applied by the two trucks is 72°. Find the magnitude of the resultant force, to the *nearest pound*.

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 the accompanying diagram, $\overline{PA}$ is tangent to circle O at A, chord $\overline{AC}$ and secant $\overline{PCED}$ are drawn, and chords $\overline{AOB}$ and $\overline{CD}$ intersect at E. If $m\widehat{AD} = 130$ and $m\angle BAC = 50$, find $m\angle P$, $m\angle BEC$, and $m\angle PCA$.



34 Solve for all values of x, to the *nearest tenth*:

$$\frac{1}{x} + \frac{1}{x+3} = 3$$

[Only an algebraic solution can receive full credit.]

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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

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

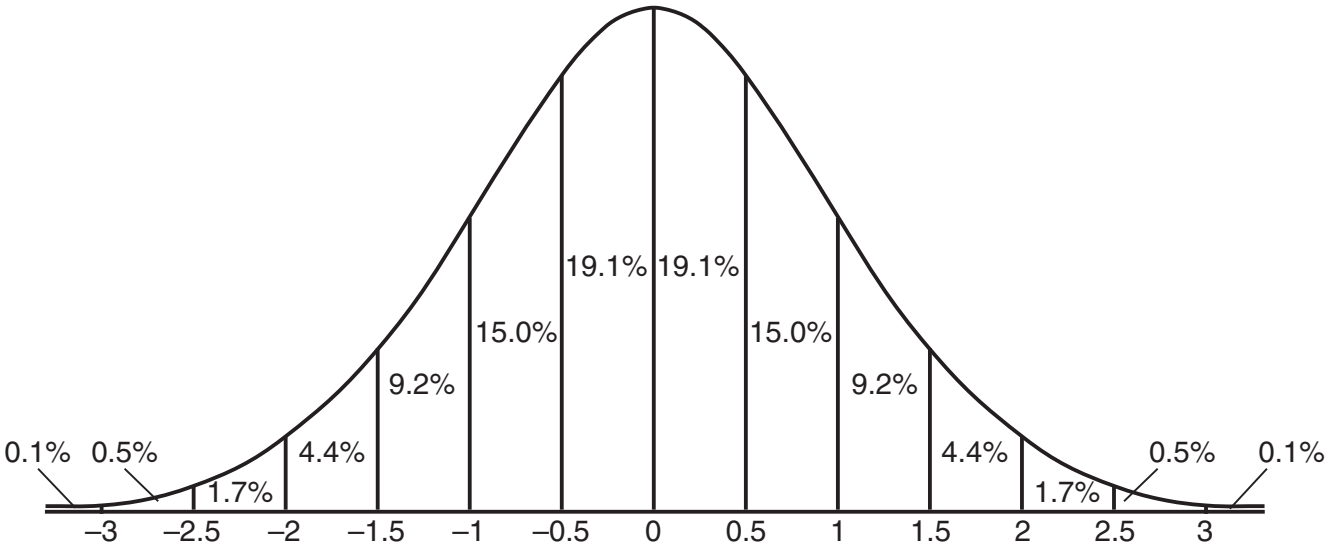
Functions of the Half Angle

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

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

Normal Curve

Standard Deviation



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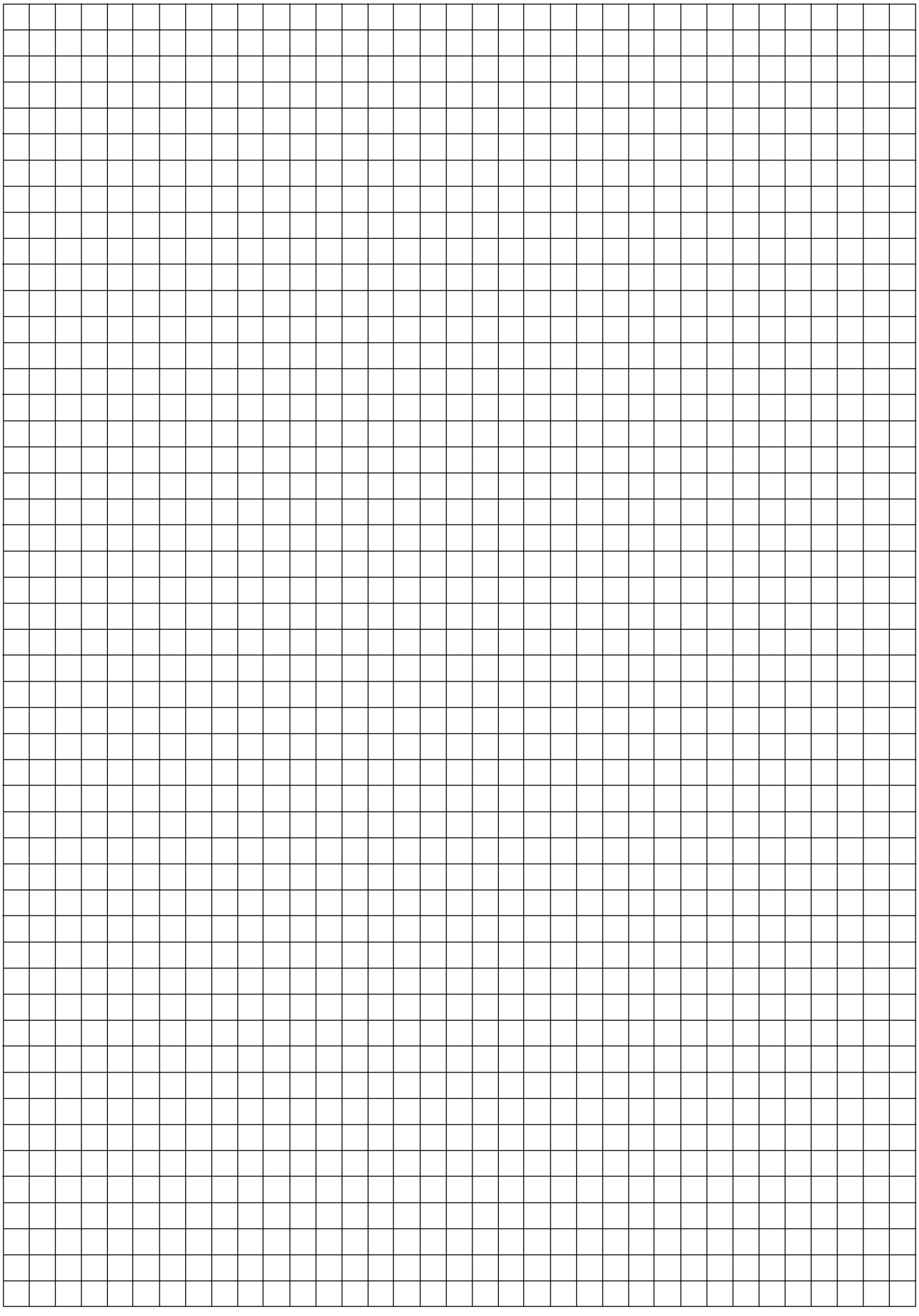
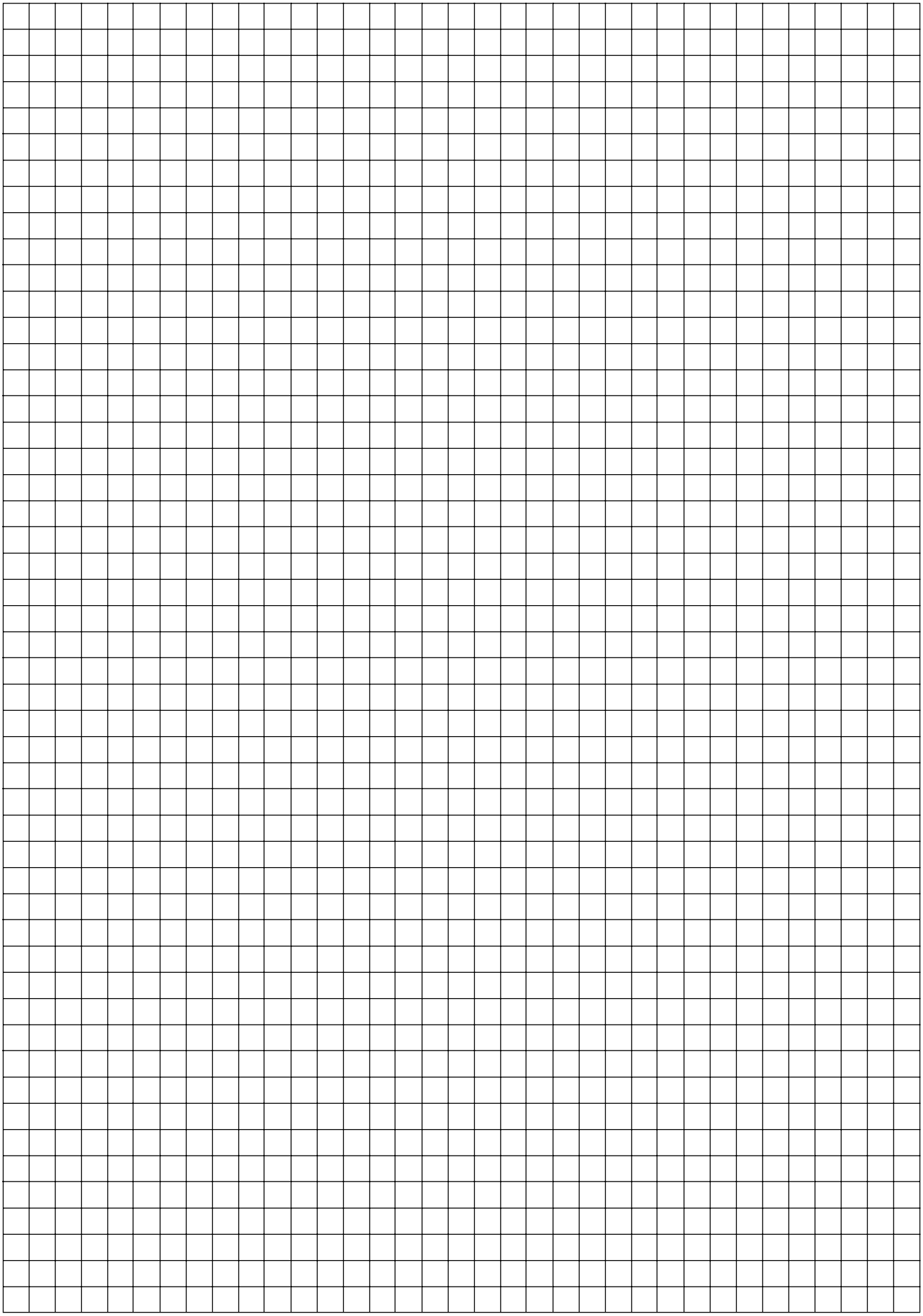
Scrap Graph Paper — This sheet will *not* be scored.



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

Tuesday, January 26, 2010 — 9:15 a.m. to 12:15 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 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.

Tear Here

Signature

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)

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MATHEMATICS B

FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS B

Tuesday, January 26, 2010 — 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 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, January 26, 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) 4	(6) 1	(11) 2	(16) 3
(2) 1	(7) 3	(12) 4	(17) 2
(3) 3	(8) 2	(13) 4	(18) 4
(4) 3	(9) 4	(14) 2	(19) 2
(5) 1	(10) 3	(15) 1	(20) 2

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]** 10, 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 $(g \circ f)(2)$.

or

[1] 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.

(22) **[2]** $\angle B \cong \angle C$ and ASA, or $\angle T \cong \angle E$ and AAS, or $\overline{AT} \cong \overline{RE}$ and SAS.

[1] A correct statement is written, but the method is not stated or is stated incorrectly.

or

[1] An acceptable method to prove congruency is stated, but no statement 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.

(23) **[2]** $8 - 3i$, and a correct graph is drawn as either a vector or a point.

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

or

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

or

[1] The solution is plotted correctly, but the difference is not stated.

or

[1] $8 - 3i$, but 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.

(24) **[2]** A correct graph connecting the points (4,3), (3,1), and (–2,–1) is drawn.

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

or

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

[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]** $17i\sqrt{3}$, 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] $17i\sqrt{3}$, 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.

(26) **[2]** $\frac{3 + \sqrt{7}}{2}$, 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] $\frac{3 + \sqrt{7}}{2}$, but no work is shown.

[0] $\frac{1}{3 - \sqrt{7}}$, but no further correct 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 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]** 172, and appropriate work is shown.

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

[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] Appropriate work is shown to find $ST = 19.96$ or $RT = 17.81$, but no further correct work is shown.

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

or

[1] 172, 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]** $y = 0.0834x + 1.259$ and 1.28, and appropriate work is shown, such as substituting 5 for x.

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

or

[3] $y = 0.0834x + 1.259$, and appropriate work is shown to find 1.676, the predicted price, but the difference in price is not found or is found incorrectly.

or

[3] The expression $0.0834x + 1.259$ is written and 1.28, and appropriate work is shown.

or

[3] $y = 0.0834x + 1.259$ and 1.28, but no work is shown.

[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] $y = 0.0834x + 1.259$, but no further correct work is shown.

or

[2] An incorrect linear equation is written, but an appropriate difference in price is found.

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

or

[1] The expression $0.0834x + 1.259$ is written, but no further correct work is shown.

or

[1] 1.28, 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]** A complete and correct proof that includes a concluding statement is written.

[3] A complete proof is written that includes a concluding statement, but one computational or graphing error is made.

or

[3] Appropriate calculations are shown to demonstrate that $\triangle JEN$ is an isosceles right triangle, but a concluding statement is missing or is incorrect.

[2] A complete proof is written that includes a concluding statement, but two or more computational or graphing errors are made.

or

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

or

[2] The triangle is proved to be isosceles, but no further correct work is shown.

or

[2] The triangle is proved to be a right triangle, but no further correct work is shown.

or

[2] Appropriate work is shown to find the slopes and lengths of $\overline{JE}$ and $\overline{EN}$, but no further correct work is shown.

[1] A complete proof is written, but one conceptual error and one computational or graphing error are made.

or

[1] JE and EN are calculated correctly, but no further correct work is shown.

or

[1] The slopes of $\overline{JE}$ and $\overline{EN}$ are calculated 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]** .73728 or $\frac{2304}{3125}$, and appropriate work is shown, such as evaluating ${}_5C_0(.2)^0(.8)^5 + {}_5C_1(.2)(.8)^4$.

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

or

[3] Appropriate work is shown, but the probability for "at least one" is 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, such as multiplying the probabilities.

or

[2] Appropriate work is shown, but $\frac{256}{625}$, the probability that "exactly one" candidate is not telling the truth, is found.

or

[2] The expression ${}_5C_0(.2)^0(.8)^5 + {}_5C_1(.2)(.8)^4$ is written, but no further correct work is shown.

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

or

[1] Appropriate work is shown, but $\frac{4}{625}$, the probability that "exactly one" candidate is telling the truth, is found.

or

[1] .73728 or $\frac{2304}{3125}$, 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.

(31) **[3]** 78,400 and 14.6, and appropriate algebraic work is shown.

or

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

or

[3] Appropriate work is shown to find 14.6, but no further correct 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] Appropriate work is shown to find 78,400, and a correct logarithmic equation is written, but no further correct work is shown.

or

[2] 78,400 and 14.6, but a method other than algebraic is used.

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

or

[1] Appropriate work is shown to find 78,400, but no further correct work is shown.

or

[1] A correct logarithmic equation is written, but no further correct work is shown.

or

[1] 78,400 and 14.6, but no work is shown.

[0] 78,400 or 14.6, 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.

(32) **[4]** 2,364, and appropriate work is shown.

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

[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 72° instead of 108°.

[1] Appropriate work is shown, but one conceptual error 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] 2,364, 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 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]** $m\angle P = 25$, $m\angle BEC = 115$, and $m\angle PCA = 115$, and appropriate work is shown, such as a labeled diagram.

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

or

[5] Appropriate work is shown to find $m\angle P = 25$, $m\angle BEC = 115$, and $m\angle PAC = 40$.

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

or

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

or

[4] Appropriate work is shown to find two of the angles, but no further correct work is shown.

or

[4] Appropriate work is shown to find 25, 115, and 115, but the angles are not labeled or are labeled incorrectly.

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

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

or

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

or

[2] Appropriate work is shown to find one of the angles, but no further correct work is shown.

or

[2] Appropriate work is shown to find $m\angle ACD = 65$ and $m\angle PAC = 40$, but no further correct work is shown.

or

[2] The measures of all three angles are stated and labeled correctly, but no work is shown.

[1] $m\overset{\frown}{BD} = 50$, $m\overset{\frown}{BC} = 100$, and $m\overset{\frown}{AC} = 80$, but no further correct work is shown.

or

[1] The measures of two of the angles are stated and labeled correctly, but no work is shown.

[0] 25, 115, and 115, 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.

(34) **[6]** 0.4 and –2.7, and appropriate algebraic work is shown.

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

or

[5] Appropriate work is shown, but only one solution is found.

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

or

[4] A correct substitution is made into the quadratic formula, but no further correct work is shown.

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

or

[3] The equation $3x^2 + 7x - 3 = 0$ is found, but no further correct work is shown.

or

[3] 0.4 and –2.7, but a method other than algebraic is used.

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

or

[2] The fractions are cleared by multiplying by the common denominator, but no further correct work is shown.

[1] A common denominator of $x(x + 3)$ is found, but no further correct work is shown.

or

[1] 0.4 and –2.7, but no work is shown.

[0] 0.4 or –2.7, 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	22, 29
Number and Numeration	13, 15, 26
Operations	2, 24, 25
Modeling/Multiple Representation	4, 9, 12, 14, 17, 23, 31, 32
Measurement	6, 8, 18, 19, 27, 33
Uncertainty	3, 16, 28, 30
Patterns/Functions	1, 5, 7, 10, 11, 20, 21, 34

Regents Examination in Mathematics B

January 2010

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

The *Chart for Determining the Final Examination Score for the January 2010 Regents Examination in Mathematics B* will be posted on the Department's web site http://www.emsc.nysed.gov/osa/ on Tuesday, January 26, 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.

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Office of State Assessment
Albany, New York 12234

IMPORTANT NOTICE

Regents Examination in
Mathematics B

Tuesday, January 26, 2010

This notice pertains to **question 31** in the **rating guide** for the Regents Examination in Mathematics B.

Teachers should revise the first descriptor to be 4 credits and delete the first "or."

Please photocopy this notice and give a copy of it to each teacher scoring this examination.

We apologize for any inconvenience this may cause you, and we thank you for your hard work on behalf of the students of New York State.

University of the State of New York
State Education Department

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

To determine the student's final examination score, find the student's total test raw score in the column labeled "Raw Score" and then locate the 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.