

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

# MATHEMATICS B

**Friday, January 28, 2005 — 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. 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.

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. The formulas that you may need to answer some questions in this examination are found on page 23.

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.

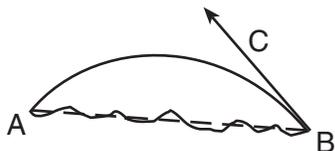
**DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.**





- 10 A small fragment of something brittle, such as pottery, is called a shard. The accompanying diagram represents the outline of a shard from a small round plate that was found at an archaeological dig.

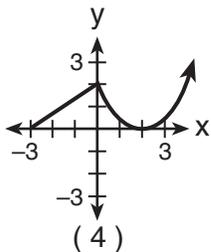
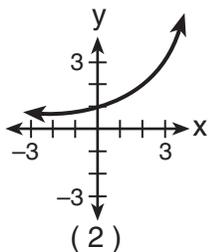
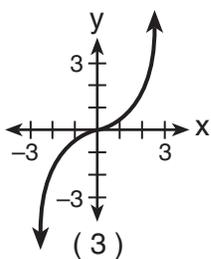
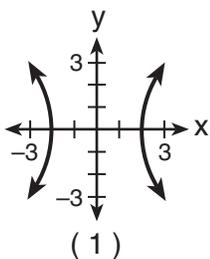
Use this space for computations.



If  $\overrightarrow{BC}$  is a tangent to  $\widehat{AB}$  at  $B$  and  $m\angle ABC = 45$ , what is the measure of  $\widehat{AB}$ , the outside edge of the shard?

- (1)  $45^\circ$                       (3)  $135^\circ$   
 (2)  $90^\circ$                       (4)  $225^\circ$

- 11 Which graph is *not* a function?



- 12 If  $A$  is a positive acute angle and  $\sin A = \frac{\sqrt{5}}{3}$ , what is  $\cos 2A$ ?

- (1)  $\frac{1}{9}$                       (3)  $\frac{1}{3}$   
 (2)  $-\frac{1}{9}$                       (4)  $-\frac{1}{3}$

13 The roots of the equation  $2x^2 - 8x - 4 = 0$  are

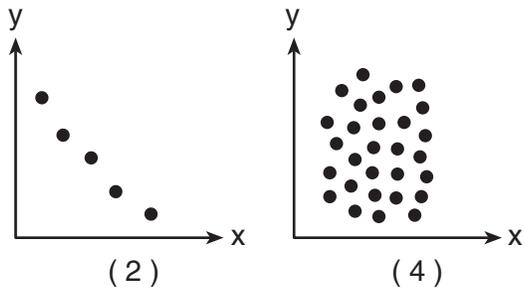
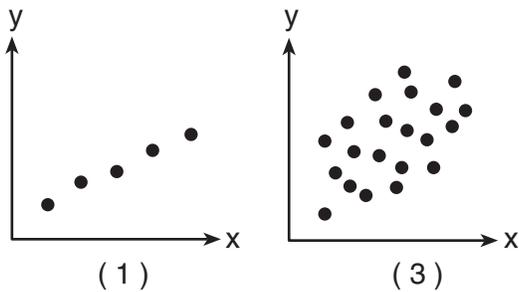
- (1) imaginary
- (2) real, rational, and equal
- (3) real, irrational, and unequal
- (4) real, rational, and unequal

Use this space for computations.

14 What is the equation of a circle with center  $(-3,1)$  and radius 7?

- (1)  $(x - 3)^2 + (y + 1)^2 = 7$
- (2)  $(x - 3)^2 + (y + 1)^2 = 49$
- (3)  $(x + 3)^2 + (y - 1)^2 = 7$
- (4)  $(x + 3)^2 + (y - 1)^2 = 49$

15 Which scatter diagram shows the strongest positive correlation?

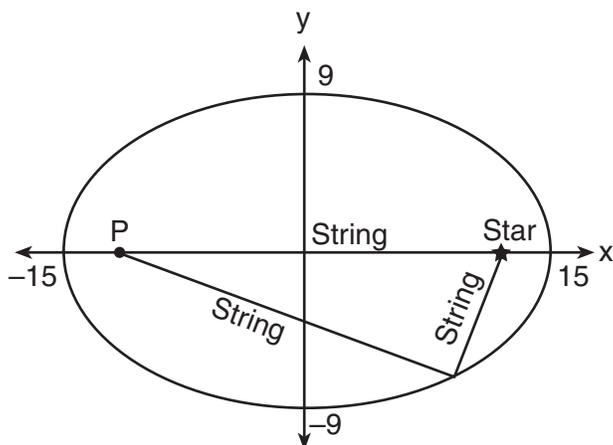


16 The expression  $\frac{7}{3 - \sqrt{2}}$  is equivalent to

- (1)  $\frac{3 + \sqrt{2}}{7}$
- (2)  $\frac{21 + \sqrt{2}}{7}$
- (3)  $3 + \sqrt{2}$
- (4)  $3 - \sqrt{2}$

- 17 The accompanying diagram shows the construction of a model of an elliptical orbit of a planet traveling around a star. Point  $P$  and the center of the star represent the foci of the orbit.

Use this space for computations.



Which equation could represent the relation shown?

- (1)  $\frac{x^2}{81} + \frac{y^2}{225} = 1$                       (3)  $\frac{x^2}{15} + \frac{y^2}{9} = 1$   
 (2)  $\frac{x^2}{225} + \frac{y^2}{81} = 1$                       (4)  $\frac{x^2}{15} - \frac{y^2}{9} = 1$

- 18 The expression  $\frac{i^{16}}{i^3}$  is equivalent to

- (1) 1    (3)  $i$   
 (2)  $-1$     (4)  $-i$

- 19 If  $\log_5 x = 2$ , what is a value of  $\sqrt{x}$ ?

- (1)  $2^{\frac{2}{5}}$     (3) 5  
 (2)  $\sqrt{5}$     (4) 25

- 20 If the coordinates of point  $A$  are  $(-2,3)$ , what is the image of  $A$  under

$r_{y\text{-axis}} \circ D_3$ ?

- (1)  $(-6,-9)$                                     (3)  $(5,6)$   
 (2)  $(9,-6)$                                     (4)  $(6,9)$

## Part II

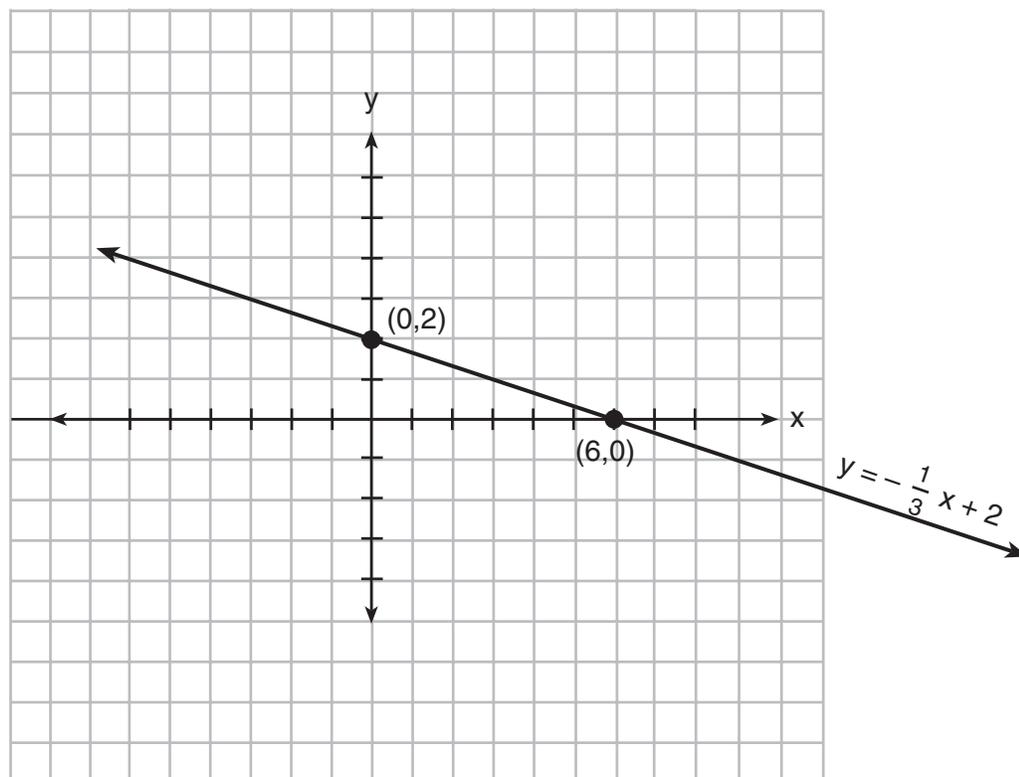
Answer all questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [12]

21 The accompanying diagram shows the graph of the line whose equation

$$is \ y = -\frac{1}{3}x + 2.$$

On the same set of axes, sketch the graph of the inverse of this function.

State the coordinates of a point on the inverse function.



**22** If  $2 + 3i$  is one root of a quadratic equation with real coefficients, what is the sum of the roots of the equation?

**23** Solve the following equation algebraically for all values of  $\theta$  in the interval  $0^\circ \leq \theta \leq 180^\circ$ .

$$2 \sin \theta - 1 = 0$$

**24** If the probability that it will rain on any given day this week is 60%, find the probability it will rain *exactly* 3 out of 7 days this week.

**25** On January 1, 1999, the price of gasoline was \$1.39 per gallon. If the price of gasoline increased by 0.5% per month, what was the cost of one gallon of gasoline, to the *nearest cent*, on January 1 one year later?

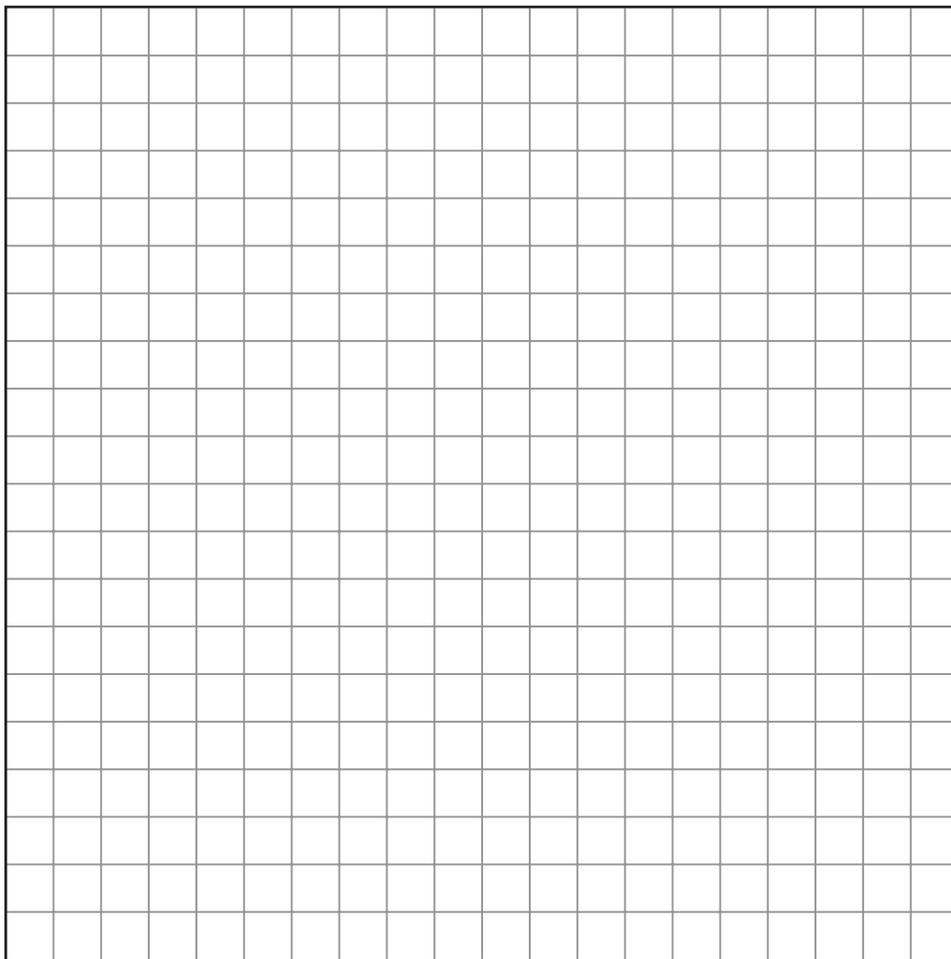
**26** An arc of a circle that is 6 centimeters in length intercepts a central angle of 1.5 radians. Find the number of centimeters in the radius of the circle.

### 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 On the accompanying grid, solve the following system of equations graphically:

$$y = -x^2 + 2x + 1$$
$$y = 2^x$$



**28** To measure the distance through a mountain for a proposed tunnel, surveyors chose points  $A$  and  $B$  at each end of the proposed tunnel and a point  $C$  near the mountain. They determined that  $AC = 3,800$  meters,  $BC = 2,900$  meters, and  $m\angle ACB = 110$ . Draw a diagram to illustrate this situation and find the length of the tunnel, to the *nearest meter*.

**29** From 1984 to 1995, the winning scores for a golf tournament were 276, 279, 279, 277, 278, 278, 280, 282, 285, 272, 279, and 278. Using the standard deviation for the sample,  $S_x$ , find the percent of these winning scores that fall within one standard deviation of the mean.

**30** A real estate agent plans to compare the price of a cottage,  $y$ , in a town on the seashore to the number of blocks,  $x$ , the cottage is from the beach. The accompanying table shows a random sample of sales and location data.

Write a linear regression equation that relates the price of a cottage to its distance from the beach.

Use the equation to predict the price of a cottage, to the *nearest dollar*, located three blocks from the beach.

<b>Number of Blocks from the Beach (<math>x</math>)</b>	<b>Price of a Cottage (<math>y</math>)</b>
5	\$132,000
0	\$310,000
4	\$204,000
2	\$238,000
1	\$275,000
7	\$60,800

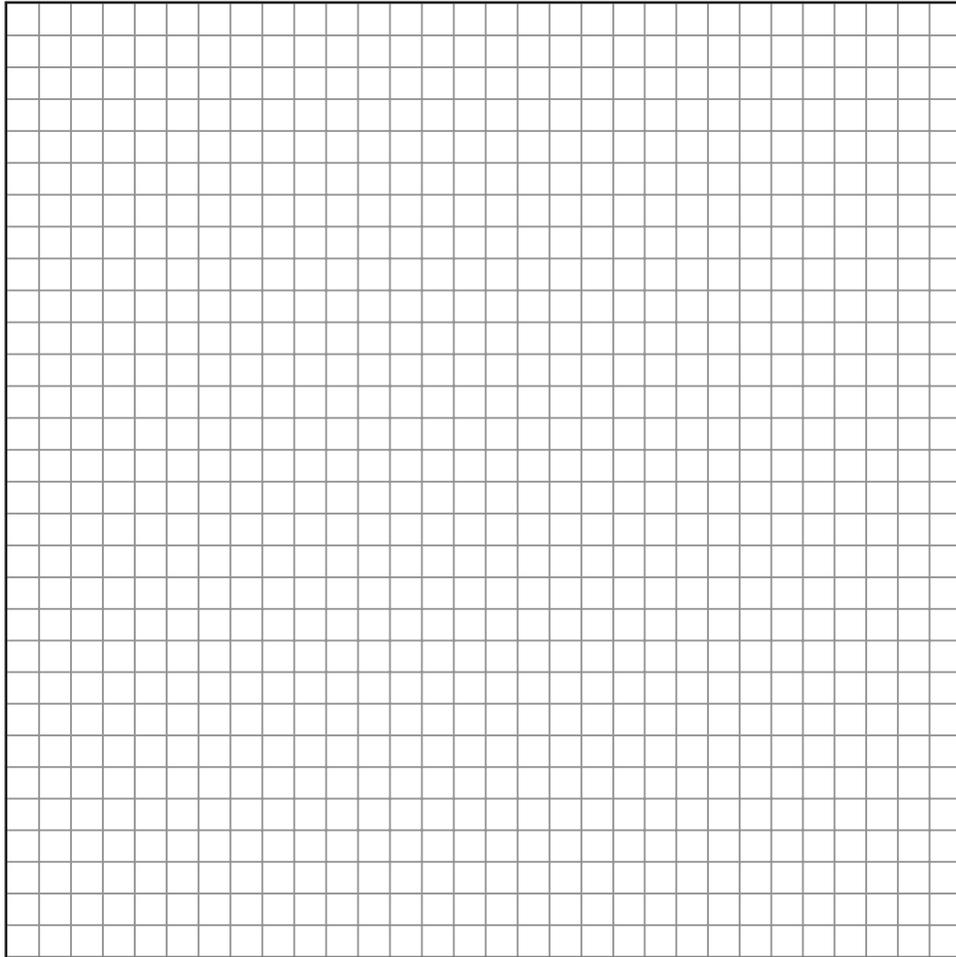
**31** The heights,  $h$ , of the students in the chorus at Central Middle School satisfy the inequality  $\left| \frac{h - 57.5}{2} \right| \leq 3.25$ , when  $h$  is measured *in inches*. Determine the interval in which these heights lie and express your answer to the *nearest tenth of a foot*. [Only an algebraic solution can receive full credit.]

**32** The number of people,  $y$ , involved in recycling in a community is modeled by the function  $y = 90\sqrt{3x} + 400$ , where  $x$  is the number of months the recycling plant has been open.

Construct a table of values, sketch the function on the grid on the next page, and find the number of people involved in recycling exactly 3 months after the plant opened.

After how many months will 940 people be involved in recycling?

**Question 32 continued**

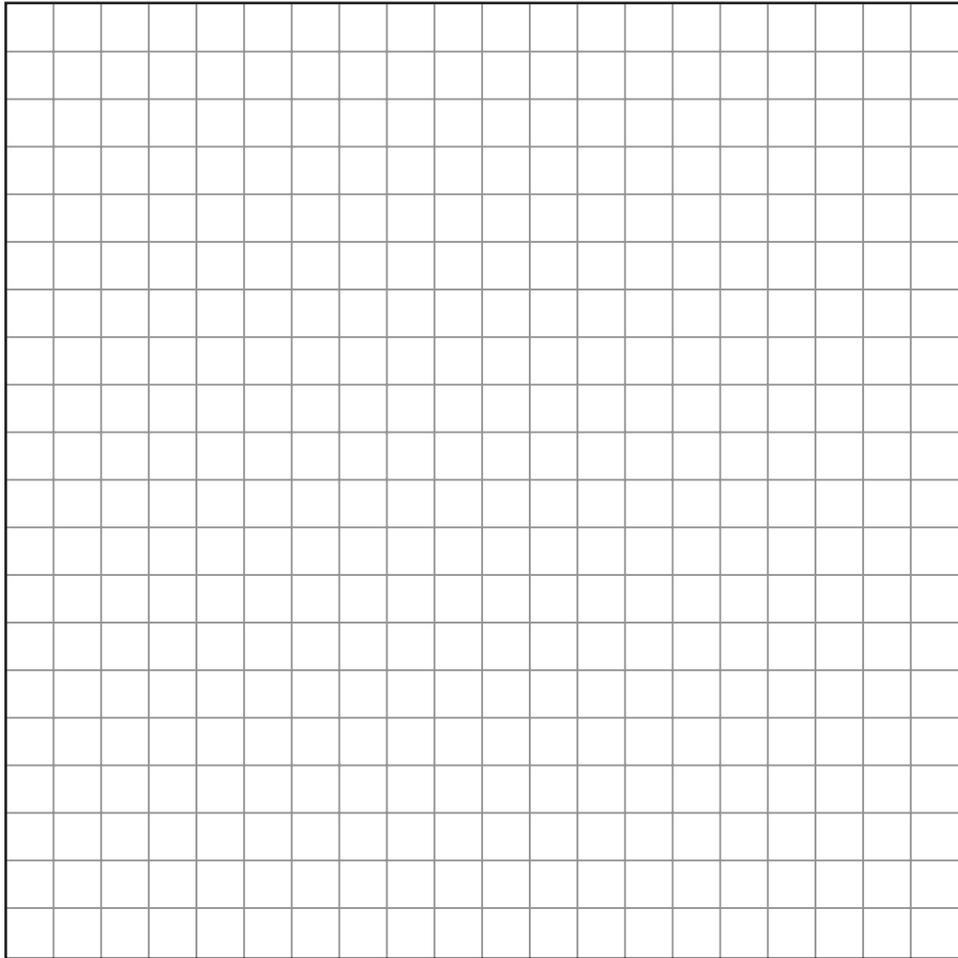


### Part IV

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 Jim is experimenting with a new drawing program on his computer. He created quadrilateral  $TEAM$  with coordinates  $T(-2,3)$ ,  $E(-5,-4)$ ,  $A(2,-1)$ , and  $M(5,6)$ . Jim believes that he has created a rhombus but not a square. Prove that Jim is correct. [The use of the grid on the next page is optional.]

**Question 33 continued**



**34** A sign 46 feet high is placed on top of an office building. From a point on the sidewalk level with the base of the building, the angle of elevation to the top of the sign and the angle of elevation to the bottom of the sign are  $40^\circ$  and  $32^\circ$ , respectively. Sketch a diagram to represent the building, the sign, and the two angles, and find the height of the building to the *nearest foot*.

# Formulas

## Area of Triangle

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

## Law of Cosines

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

## 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 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 Difference of Two Angles

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

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

## Functions of the Half Angle

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

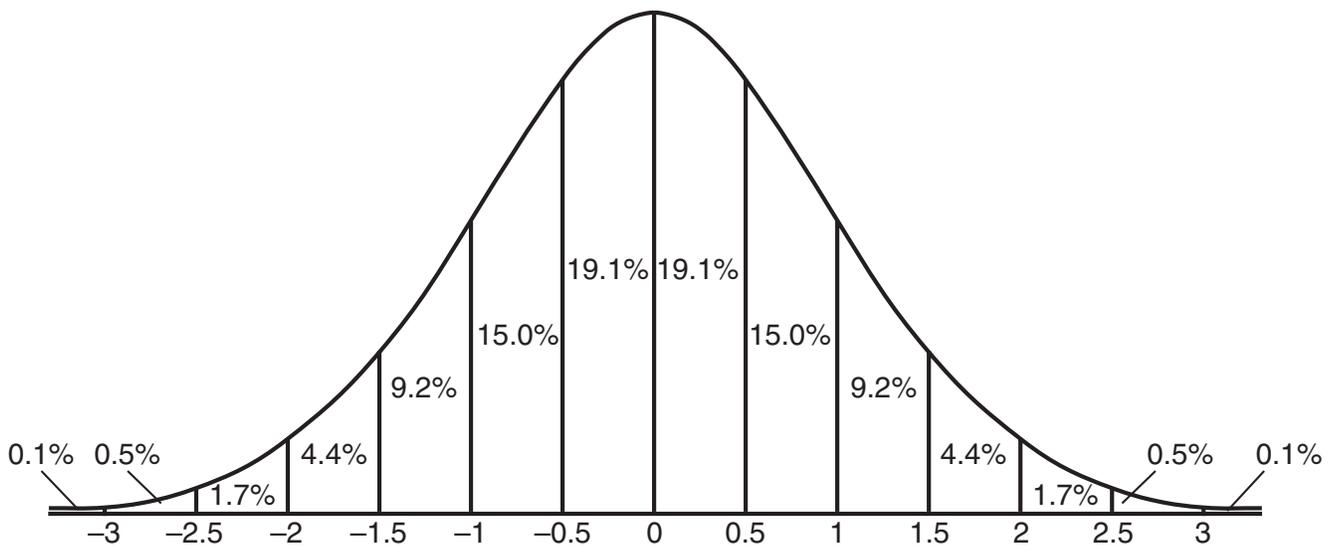
$$\cos \frac{1}{2} A = \pm \sqrt{\frac{1 + \cos A}{2}}$$

## Law of Sines

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

## Normal Curve

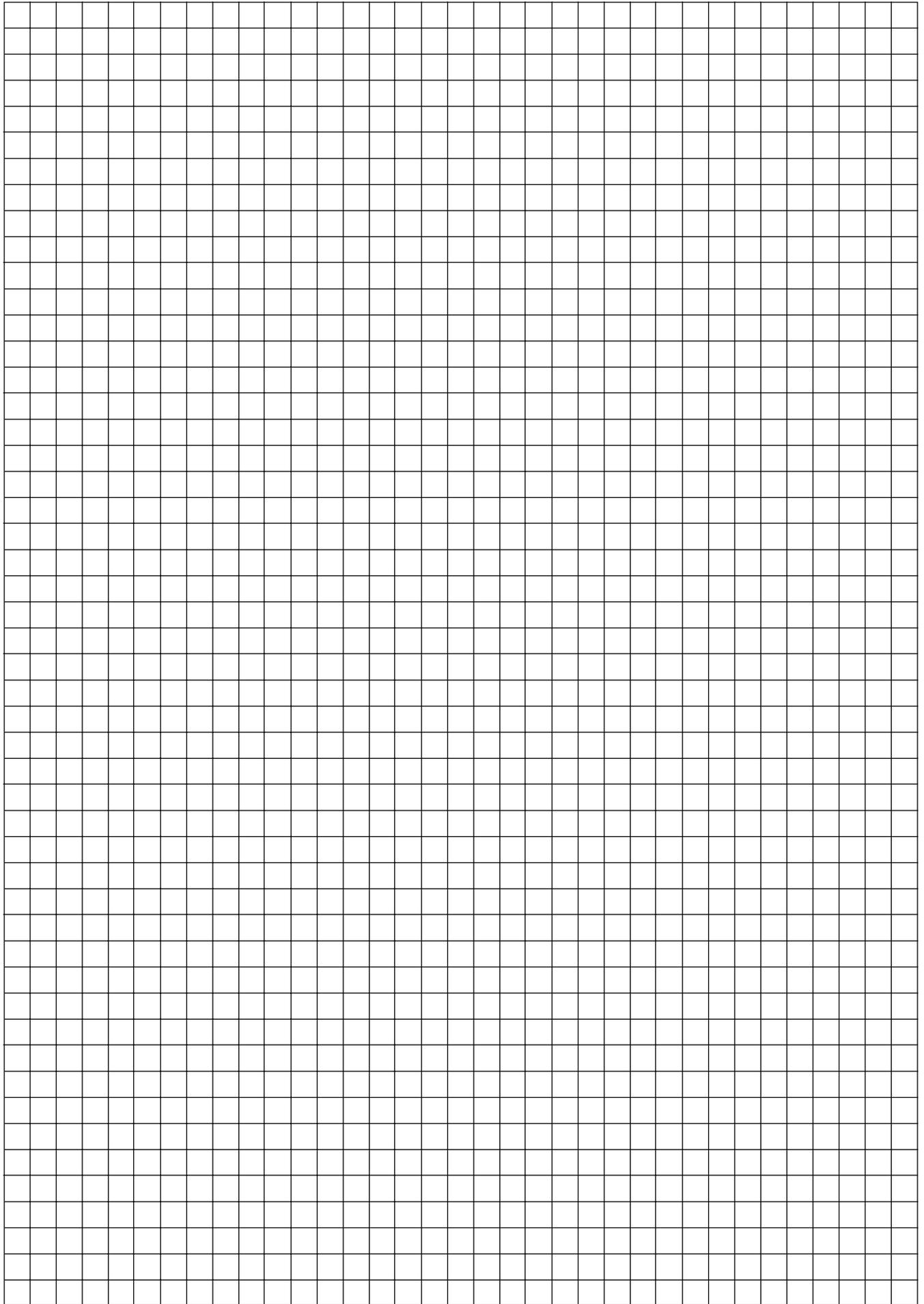
### Standard Deviation



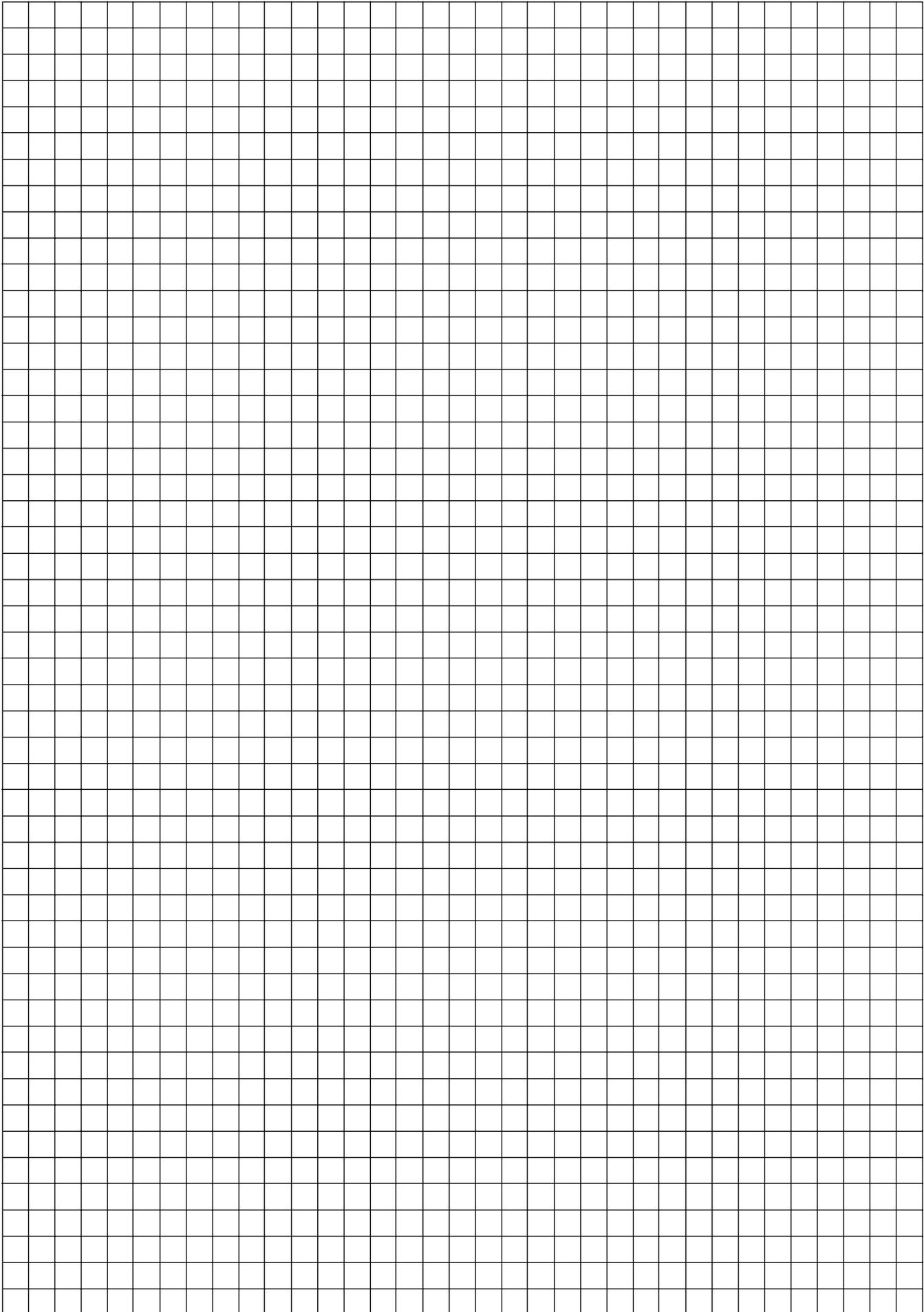
Scrap Graph Paper — This sheet will *not* be scored.

Tear Here

Tear Here



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



Tear Here

Tear Here

Tear Here

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS B

Friday, January 28, 2005 — 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 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

Tear Here



# FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

## MATHEMATICS B

Friday, January 28, 2005 — 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 Administering and 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 Friday, January 28, 2005. 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) 1	(6) 4	(11) 1	(16) 3
(2) 2	(7) 3	(12) 2	(17) 2
(3) 1	(8) 4	(13) 3	(18) 3
(4) 2	(9) 1	(14) 4	(19) 3
(5) 3	(10) 2	(15) 1	(20) 4

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. Visit the site <http://www.emsc.nysed.gov/osa/> and select the link “Latest Information” for any recently posted information regarding this examination. This site should be checked before the rating process for this examination begins and at least one more time before the final scores for the examination are recorded.

### 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 Administering and Scoring 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] An appropriate reflection of  $f(x)$  in the line  $y = x$  is sketched, and the coordinates of one point are stated correctly.

- [1] An appropriate graph is sketched, but no coordinates or incorrect coordinates are stated.

*or*

- [1] A reflection in some other line is sketched, but appropriate coordinates are stated.

*or*

- [1] An incorrect graph is sketched, based on an error in plotting one of the points, but appropriate coordinates are stated.

- [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] 4, 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] The second root of the equation is found, but the sum of the roots is not calculated or is calculated incorrectly.

*or*

- [1] 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.

MATHEMATICS B – *continued*

(23) [2] 30 and 150, 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] Appropriate work is shown, but only 30 or 150 is found.

**or**

[1] 30 and 150, but no work is shown.

[0] 30 *or* 150, but no work is shown.

**or**

[0] The value of  $\sin \theta$  is shown to be  $\frac{1}{2}$ .

**or**

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

(24) [2]  $\frac{15,120}{78,125}$  or 19.35% or an equivalent answer, and appropriate work is shown, such as  ${}_7C_3(.6)^3(.4)^4$ .

[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] A correct expression, such as  ${}_7C_3(.6)^3(.4)^4$ , is written, but no further correct work is shown.

**or**

[1] An incorrect expression of equal difficulty is evaluated appropriately.

**or**

[1]  $\frac{15,120}{78,125}$  or 19.35% 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.

MATHEMATICS B – *continued*

(25) [2] \$1.48, and appropriate work is shown, such as providing a correctly labeled table or solving the equation  $(1.39)(1.005)^{12} = C$ .

[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, such as using 1.05 or 1.5 or using an incorrect exponent.

***or***

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

***or***

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

***or***

[1] \$1.48, 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] 4, 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] 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.

---

**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] (0,1) and (1,2), and a correct graph is drawn with at least one function labeled.

[3] Appropriate work is shown, but one graphing error is made, such as plotting one point incorrectly or not labeling either function.

***or***

[3] The graphs are drawn correctly, 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 graphing errors are made.

***or***

[2] (0,1) and (1,2), but the solution is found by a nongraphic method.

***or***

[2] The graphs are drawn correctly, but no correct solutions are found.

[1] The graph of only one equation is drawn correctly, and no further correct work is shown.

***or***

[1] (0,1) and (1,2), but no work is shown.

[0] (0,1) *or* (1,2), 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.

MATHEMATICS B – *continued*

- (28) [4] 5,513 and a correct diagram is drawn, and appropriate work is shown, such as using the Law of Cosines.
- [3] Appropriate work is shown, but one computational or rounding error is made.
- or***
- [3] 5,513, and appropriate work is shown, but no diagram is drawn.
- or***
- [3] Appropriate work is shown, but the calculations are performed in radians, resulting in an answer of 6,698.
- or***
- [3] An incorrect diagram is drawn, but an appropriate solution is found using the Law of Cosines.
- [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, but an incorrect substitution is made into the Law of Cosines, but an appropriate solution is found.
- [1] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.
- or***
- [1] Correct substitution is made into the Law of Cosines, but no further correct work is shown.
- or***
- [1] A correctly labeled diagram is drawn, but no further correct work is shown.
- or***
- [1] 5,513, but no work is shown and no diagram 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.

MATHEMATICS B – *continued*

- (29) [4] 75, and appropriate work is shown, such as determining the mean (278.5833333) and the standard deviation for the sample (3.146667309).
- [3] Appropriate work is shown, but one computational or rounding error is made.
- or***
- [3] Appropriate work is shown, but the standard deviation for the population ( $\sigma$ ) is used.
- or***
- [3] The mean, standard deviation for the sample, and interval are determined correctly, but an error is made in determining the percentage.
- or***
- [3] The mean and standard deviation for the sample are determined correctly, but an appropriate percentage is determined for an incorrect interval.
- [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 mean and standard deviation for the sample are determined correctly, but no further correct work is shown.
- or***
- [2] Either the mean or the standard deviation for the sample is determined incorrectly, but an appropriate percentage is found.
- [1] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.
- or***
- [1] The standard deviation for the sample is determined correctly, but no further correct work is shown.
- or***
- [1] 75, but no work is shown.
- [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

MATHEMATICS B – *continued*

(30) [4]  $y = -34739.71292x + 313309.0909$  and 209,090, and appropriate work is shown.

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

***or***

[3] An incorrect linear equation with a negative slope is written, but an appropriate price is found for three blocks from the beach.

[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 function is written, but no further correct work is shown.

***or***

[2] An incorrect linear equation with a positive slope is written, but an appropriate price is found for three blocks from the beach.

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

***or***

[1] 209,090, but no work is shown.

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

MATHEMATICS B – *continued*

- (31) [4] 4.3–5.3, and appropriate work is shown.
- [3] Appropriate work is shown, but one computational or rounding error is made.
- or**
- [3] Appropriate work is shown, but the answer is not stated as an interval.
- or**
- [3] Appropriate work is shown, but the answer is expressed in inches.
- [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 appropriate inequality, such as  $-3.25 \leq \frac{h - 57.5}{2} \leq 3.25$ , 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] Only half of the inequality is solved, but an appropriate answer is found and expressed to the nearest tenth of a foot.
- or**
- [1] 4.3–5.3, 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.

MATHEMATICS B – *continued*

(32) [4] A correct table of values is provided, a correct graph is drawn, and 670; 12, and appropriate work is shown, such as extending the graph or solving algebraically.

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

***or***

[3] A correct table of values is provided, a correct graph is drawn, and 670, but no further correct work is shown.

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

***or***

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

***or***

[2] 670 and 12, but an algebraic solution is provided.

***or***

[2] 670 and 12, but either the graph is not drawn or the table of values is not provided.

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

***or***

[1] A correct graph is drawn, but no further correct work is shown.

***or***

[1] A correct table of values is provided, but no further correct work is shown.

***or***

[1] 670 and 12, but no work is shown and no graph is drawn.

[0] 670 *or* 12, but no work is shown and no graph is drawn.

***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] A complete and correct proof is shown.
- [5] Appropriate work is shown, but one computational error is made.
- or***
- [5] Appropriate work is shown, but the final conclusion is not justified or is justified incorrectly.
- [4] Appropriate work is shown, but two or more computational errors are made.
- or***
- [4] Appropriate work is shown to prove  $TEAM$  is a parallelogram and not a square, but no work is shown to prove it is a rhombus.
- or***
- [4] Appropriate work is shown to prove  $TEAM$  is a rhombus, and partial work is shown to prove  $TEAM$  is not a square, but the conclusion is not adequately justified.
- [3] Appropriate work is shown to prove  $TEAM$  is a rhombus, but no further correct work is shown.
- or***
- [3] Appropriate work is shown to prove  $TEAM$  is not a square, but an incorrect method is used to prove  $TEAM$  is a rhombus.
- or***
- [3] An accurate explanation of the process required to complete the proof is stated, and needed formulas are given, but no further correct work is shown.
- [2] Appropriate work is shown to prove  $TEAM$  is a parallelogram, but no further correct work is shown.
- [1] A complete explanation of the method of the proof is written, but no further correct work is shown.
- or***
- [1] A statement that  $TEAM$  is not a square and a correct reason are written, 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.

- (34) [6] A correct diagram is drawn and 134, and appropriate work is shown.
- [5] Appropriate work is shown, but one computational or rounding error is made.
- or***
- [5] 134, and appropriate work is shown, but the diagram is not drawn or is drawn incorrectly.
- [4] Appropriate work is shown, but two or more computational or rounding errors are made.
- or***
- [4] A correct diagram is drawn and one correct equation using the Law of Sines is solved appropriately, but no further correct work is shown.
- [3] Appropriate work is shown, but one conceptual error is made.
- or***
- [3] An incorrect diagram is drawn, but an appropriate solution with an equal degree of difficulty is provided.
- or***
- [3] A correct diagram is drawn and correct equations are written, but no further correct work is shown.
- [2] Appropriate work is shown, but one conceptual error and one computational or rounding error are made.
- or***
- [2] A correct diagram is drawn, but only one correct trigonometric equation is written, and no further correct work is shown.
- [1] A correct diagram is drawn, but no further correct work is shown.
- or***
- [1] An incorrect diagram is drawn, but one correct trigonometric equation is solved appropriately.
- or***
- [1] 134, but no work is shown and no diagram 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.
-

**Map to Learning Standards**

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

**Regents Examination in Mathematics B**

**January 2005**

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

*The Chart for Determining the Final Examination Score for the January 2005 Regents Examination in Mathematics B, normally located on this page, will be posted on the Department's web site <http://www.emsc.nysed.gov/osa/> on Friday, January 28, 2005. Conversion charts provided for previous administrations of the Mathematics B examination must NOT be used to determine students' final scores for this administration.*



## Regents Examination in Mathematics B January 2005

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

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, 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 Mathematics B examination.