The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS B

Friday, June 20, 2003 — 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. Any work done on this sheet of scrap graph paper will *not* be scored. All work should be written 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 19.

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 your use while taking this examination.

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 For which value of x is $y = \log x$ undefined?

(1) 0
(2) $\frac{1}{10}$
(3) π
(4) 1.483

2 If $\sin \theta > 0$ and $\sec \theta < 0$, in which quadrant does the terminal side of angle θ lie?

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

3 What is the value of x in the equation $81^{x+2} = 27^{5x+4}$?

(1) $-\frac{2}{11}$
(2) $-\frac{3}{2}$
(3) $\frac{4}{11}$
(4) $-\frac{4}{11}$

4 The relationship between voltage, E, current, I, and resistance, Z, is given by the equation $E = IZ$. If a circuit has a current $I = 3 + 2i$ and a resistance $Z = 2 - i$, what is the voltage of this circuit?

(1) $8 + i$
(2) $8 + 7i$
(3) $4 + i$
(4) $4 - i$

5 Which expression is equivalent to $\frac{4}{3+\sqrt{2}}$?

(1) $\frac{12 + 4\sqrt{2}}{7}$
(2) $\frac{12 + 4\sqrt{2}}{11}$
(3) $\frac{12 - 4\sqrt{2}}{7}$
(4) $\frac{12 - 4\sqrt{2}}{11}$

6 What are the coordinates of point P, the image of point (3,–4) after a reflection in the line $y = x$?

(1) (3,4)
(2) (–3,4)
(3) (4,–3)
(4) (–4,3)

Use this space for computations.

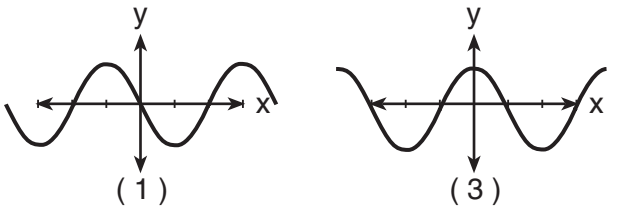
7 The roots of the equation $ax^2 + 4x = -2$ are real, rational, and equal when a has a value of

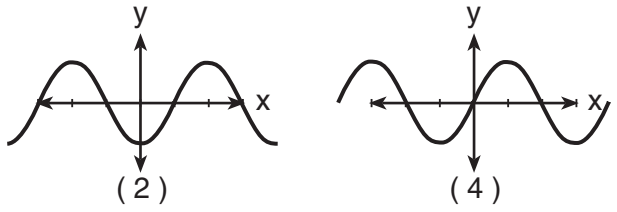
(1) 1
(2) 2
(3) 3
(4) 4

8 Two objects are 2.4×10^{20} centimeters apart. A message from one object travels to the other at a rate of 1.2×10^5 centimeters per second. How many seconds does it take the message to travel from one object to the other?

(1) 1.2×10^{15}
(2) 2.0×10^4
(3) 2.0×10^{15}
(4) 2.88×10^{25}

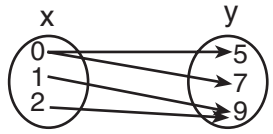
9 If $f(x) = \cos x$, which graph represents $f(x)$ under the composition $r_{y\text{-axis}} \circ r_{x\text{-axis}}$?



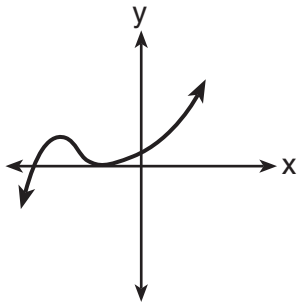


10 Which diagram represents a relation in which each member of the domain corresponds to only one member of its range?

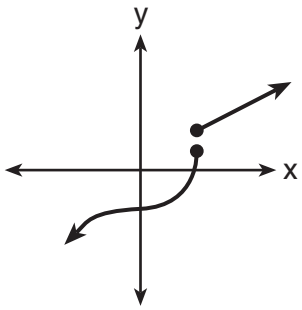
Use this space for computations.



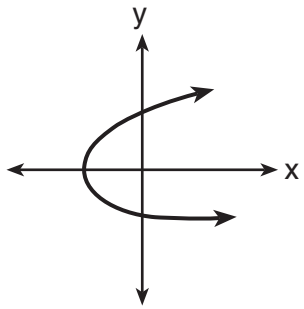
(1)



(3)

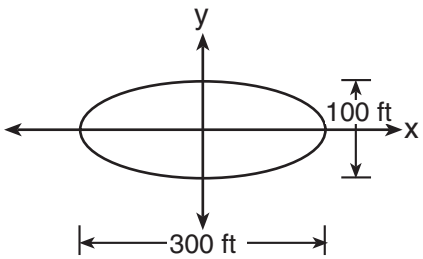


(2)



(4)

11 The accompanying diagram represents the elliptical path of a ride at an amusement park.



Which equation represents this path?

(1) $x^2 + y^2 = 300$

(2) $y = x^2 + 100x + 300$

(3) $\frac{x^2}{150^2} + \frac{y^2}{50^2} = 1$

(4) $\frac{x^2}{150^2} - \frac{y^2}{50^2} = 1$

12 If A and B are positive acute angles, $\sin A = \frac{5}{13}$, and $\cos B = \frac{4}{5}$, what is the value of $\sin (A + B)$?

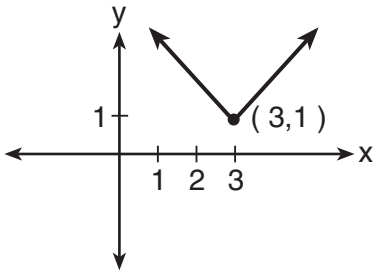
(1) $\frac{56}{65}$
(2) $\frac{63}{65}$
(3) $\frac{33}{65}$
(4) $-\frac{16}{65}$

Use this space for computations.

13 Which transformation is an opposite isometry?

(1) dilation
(2) line reflection
(3) rotation of 90°
(4) translation

14 Which equation is represented by the accompanying graph?



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

15 What is the value of $i^{99} - i^3$?

(1) 1
(2) i^{96}
(3) $-i$
(4) 0

16 If $\log a = 2$ and $\log b = 3$, what is the numerical value of $\log \frac{\sqrt{a}}{b^3}$?

(1) 8
(2) –8
(3) 25
(4) –25

Use this space for computations.

17 In simplest form, $\dfrac{\frac{1}{x^2} - \frac{1}{y^2}}{\frac{1}{y} + \frac{1}{x}}$ is equal to

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

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

(3) $x - y$

(4) $y - x$

18 What is the solution set of the inequality $|3 - 2x| \geq 4$?

(1) $\left\{x \middle| \frac{7}{2} \leq x \leq -\frac{1}{2}\right\}$

(2) $\left\{x \middle| -\frac{1}{2} \leq x \leq \frac{7}{2}\right\}$

(3) $\left\{x \middle| x \leq -\frac{1}{2} \text{ or } x \geq \frac{7}{2}\right\}$

(4) $\left\{x \middle| x \leq \frac{7}{2} \text{ or } x \geq -\frac{1}{2}\right\}$

19 What value of x in the interval $0° \leq x \leq 180°$ satisfies the equation $\sqrt{3} \tan x + 1 = 0$?

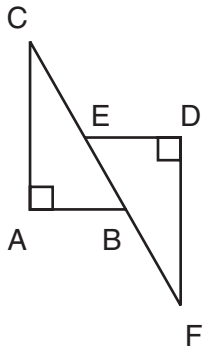
(1) $-30°$

(2) $30°$

(3) $60°$

(4) $150°$

20 In the accompanying diagram, $\overline{CA} \perp \overline{AB}$, $\overline{ED} \perp \overline{DF}$, $\overline{ED} \parallel \overline{AB}$, $\overline{CE} \cong \overline{BF}$, $\overline{AB} \cong \overline{ED}$, and $m\angle CAB = m\angle FDE = 90$.



Which statement would *not* be used to prove $\triangle ABC \cong \triangle DEF$?

(1) SSS $\cong$ SSS

(2) SAS $\cong$ SAS

(3) AAS $\cong$ AAS

(4) HL $\cong$ HL

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 Vanessa throws a tennis ball in the air. The function $h(t) = -16t^2 + 45t + 7$ represents the distance, in feet, that the ball is from the ground at any time t. At what time, to the *nearest tenth of a second,* is the ball at its maximum height?

22 If $f(x) = 2^x - 1$ and $g(x) = x^2 - 1$, determine the value of $(f \circ g)(3)$.

23 When air is pumped into an automobile tire, the pressure is inversely proportional to the volume. If the pressure is 35 pounds when the volume is 120 cubic inches, what is the pressure, in pounds, when the volume is 140 cubic inches?

24 In a certain school district, the ages of all new teachers hired during the last 5 years are normally distributed. Within this curve, 95.4% of the ages, centered about the mean, are between 24.6 and 37.4 years. Find the mean age and the standard deviation of the data.

25 Express the following rational expression in simplest form:

$$\frac{9 - x^2}{10x^2 - 28x - 6}$$

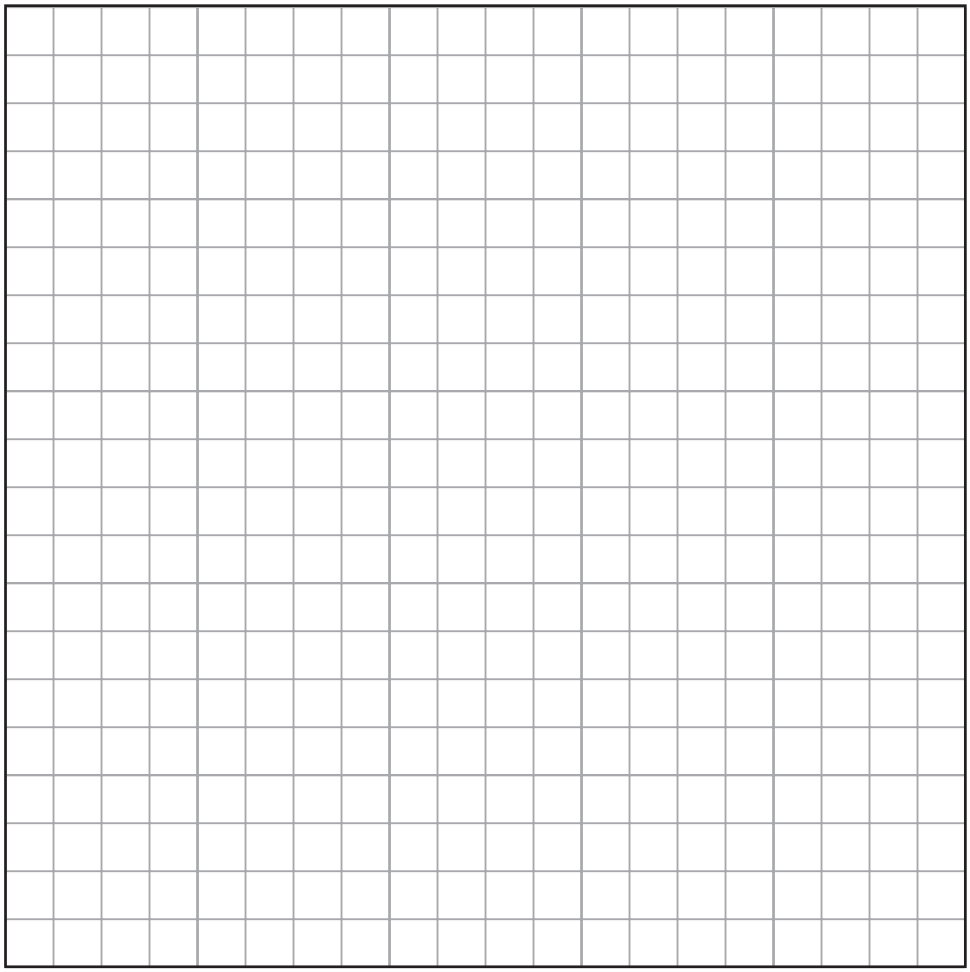
26 Evaluate: $2\sum_{n=1}^{5}(2n - 1)$

Part III

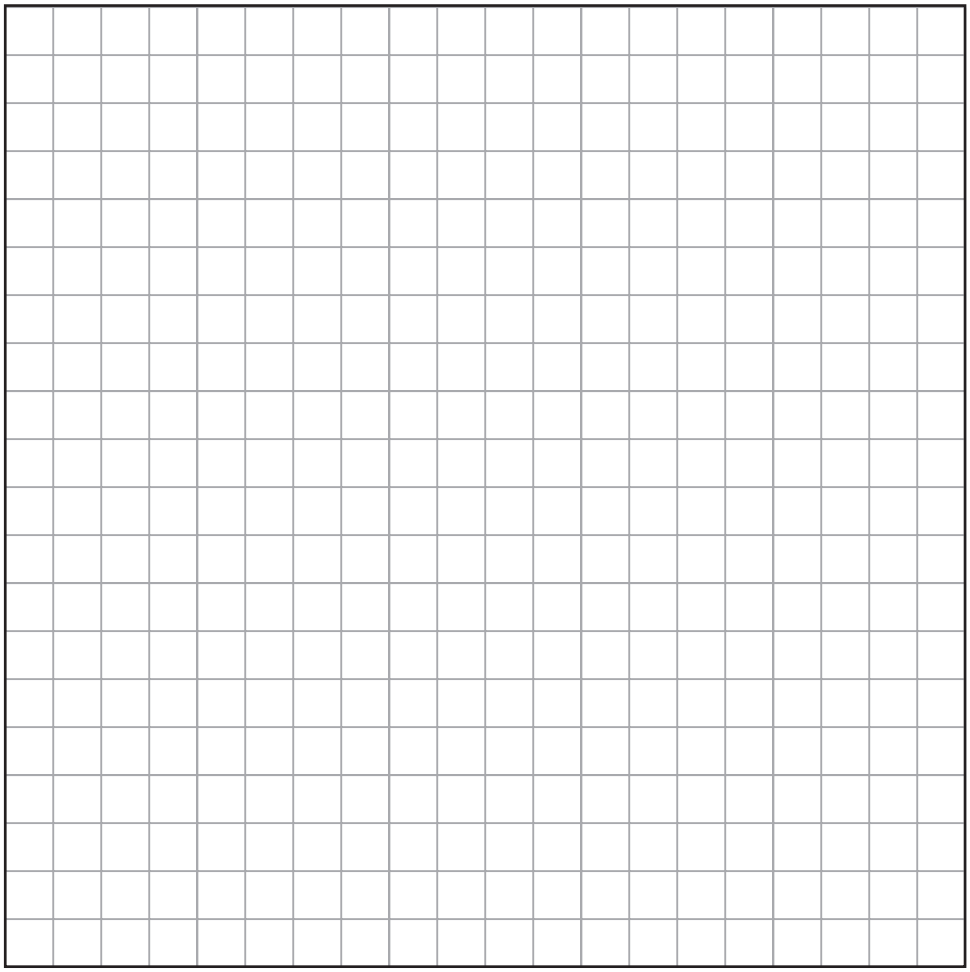
Answer all questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [24]

27 The coordinates of quadrilateral $ABCD$ are $A(-1,-5)$, $B(8,2)$, $C(11,13)$, and $D(2,6)$. Using coordinate geometry, prove that quadrilateral $ABCD$ is a rhombus. [The use of the grid on the next page is optional.]

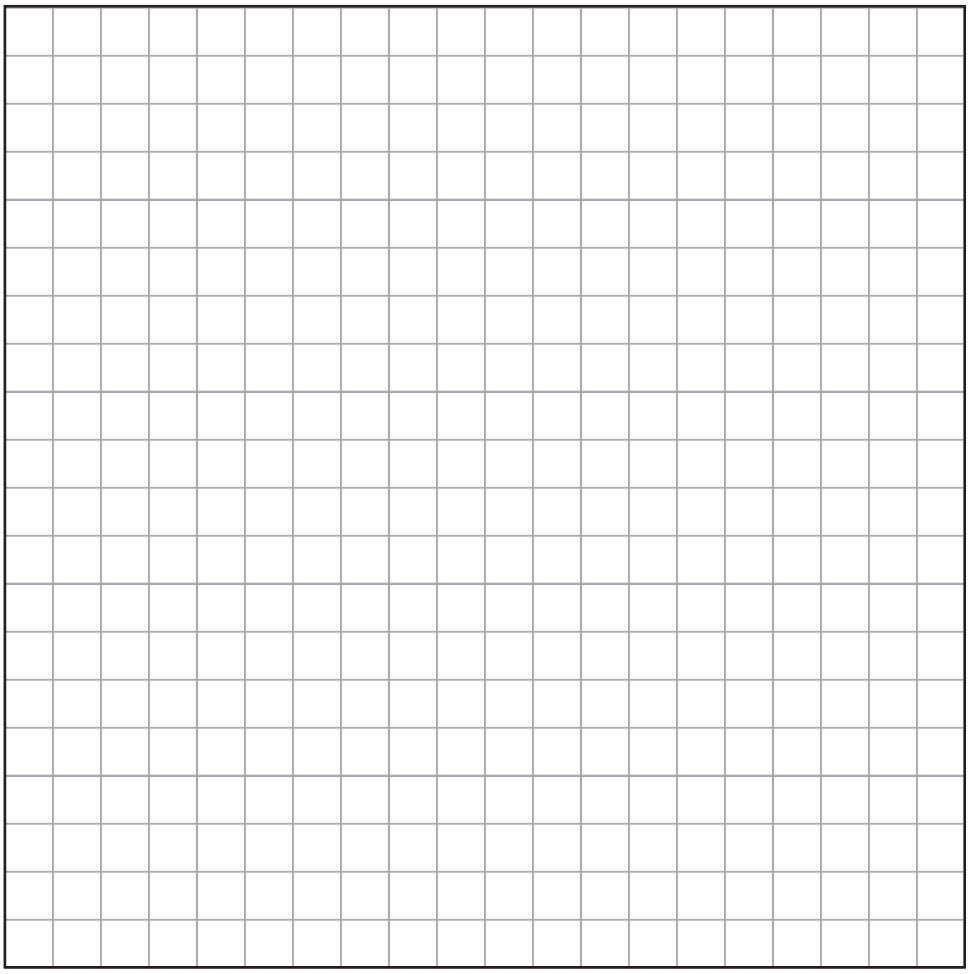
Question 27 continued



28 The price of a stock, $A(x)$, over a 12-month period decreased and then increased according to the equation $A(x) = 0.75x^2 - 6x + 20$, where x equals the number of months. The price of another stock, $B(x)$, increased according to the equation $B(x) = 2.75x + 1.50$ over the same 12-month period. Graph and label both equations on the accompanying grid. State all prices, to the *nearest dollar,* when both stock values were the same.



29 A pair of figure skaters graphed part of their routine on a grid. The male skater's path is represented by the equation $m(x) = 3 \sin \frac{1}{2}x$, and the female skater's path is represented by the equation $f(x) = -2 \cos x$. On the accompanying grid, sketch both paths and state how many times the paths of the skaters intersect between $x = 0$ and $x = 4\pi$.



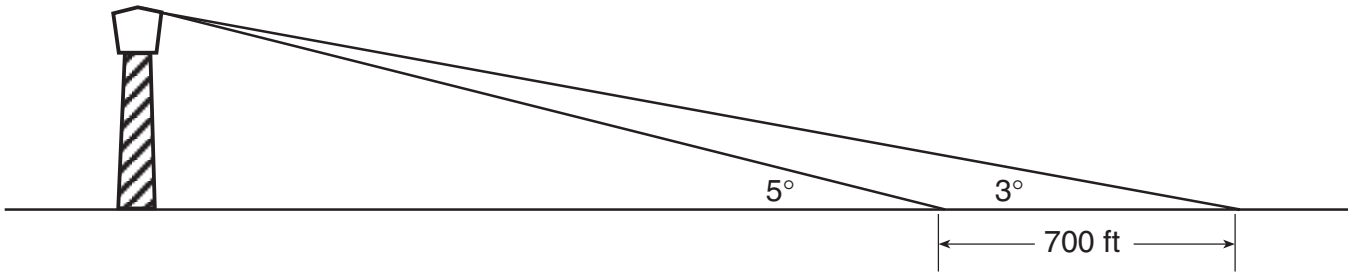
30 Sean invests \$10,000 at an annual rate of 5% compounded continuously, according to the formula $A = Pe^{rt}$, where A is the amount, P is the principal, $e = 2.718$, r is the rate of interest, and t is time, in years.

Determine, to the *nearest dollar*, the amount of money he will have after 2 years.

Determine how many years, to the *nearest year*, it will take for his initial investment to double.

31 On any given day, the probability that the entire Watson family eats dinner together is $\frac{2}{5}$. Find the probability that, during any 7-day period, the Watsons eat dinner together *at least* six times.

32 While sailing a boat offshore, Donna sees a lighthouse and calculates that the angle of elevation to the top of the lighthouse is 3°, as shown in the accompanying diagram. When she sails her boat 700 feet closer to the lighthouse, she finds that the angle of elevation is now 5°. How tall, to the *nearest tenth of a foot*, is the lighthouse?



(Not drawn to scale)

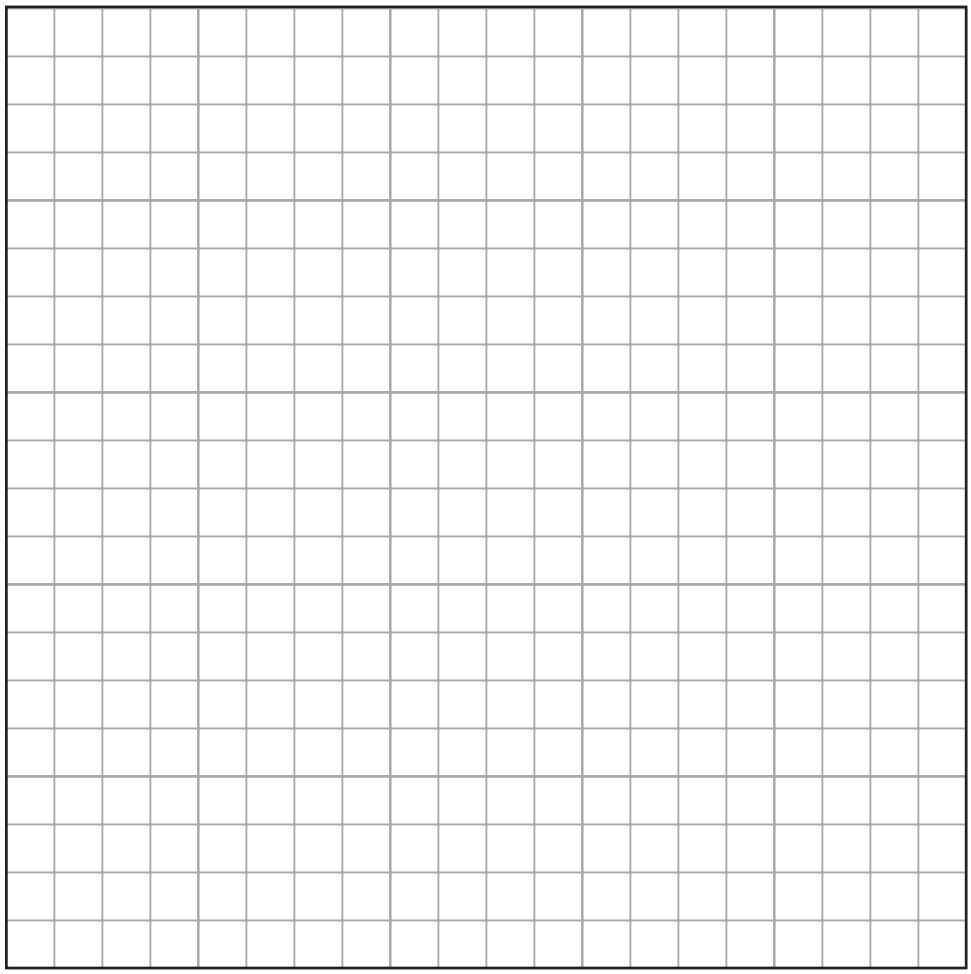
Part IV

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 A farmer has determined that a crop of strawberries yields a yearly profit of $1.50 per square yard. If strawberries are planted on a triangular piece of land whose sides are 50 yards, 75 yards, and 100 yards, how much profit, to the *nearest hundred dollars,* would the farmer expect to make from this piece of land during the next harvest?

34 For a carnival game, John is painting two circles, V and M, on a square dartboard.

a On the accompanying grid, draw and label circle V, represented by the equation $x^2 + y^2 = 25$, and circle M, represented by the equation $(x - 8)^2 + (y + 6)^2 = 4$.



b A point, (x,y), is randomly selected such that $-10 \leq x \leq 10$ and $-10 \leq y \leq 10$. What is the probability that point (x,y) lies outside both circle V and circle M?

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

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

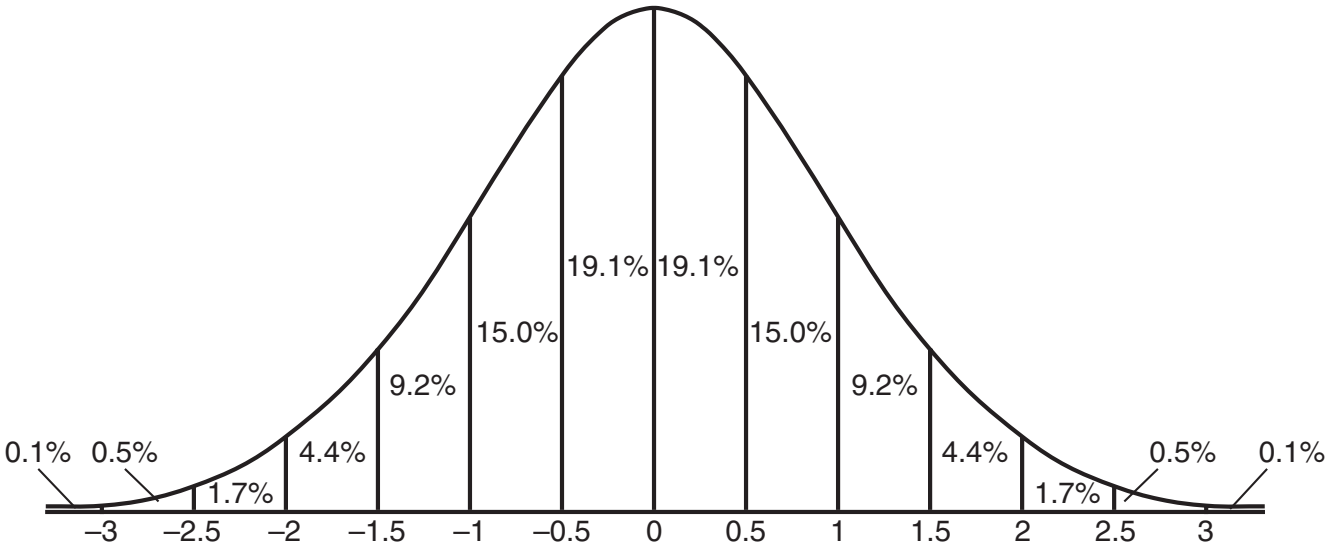
Functions of the Half Angle

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

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

Normal Curve

Standard Deviation



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

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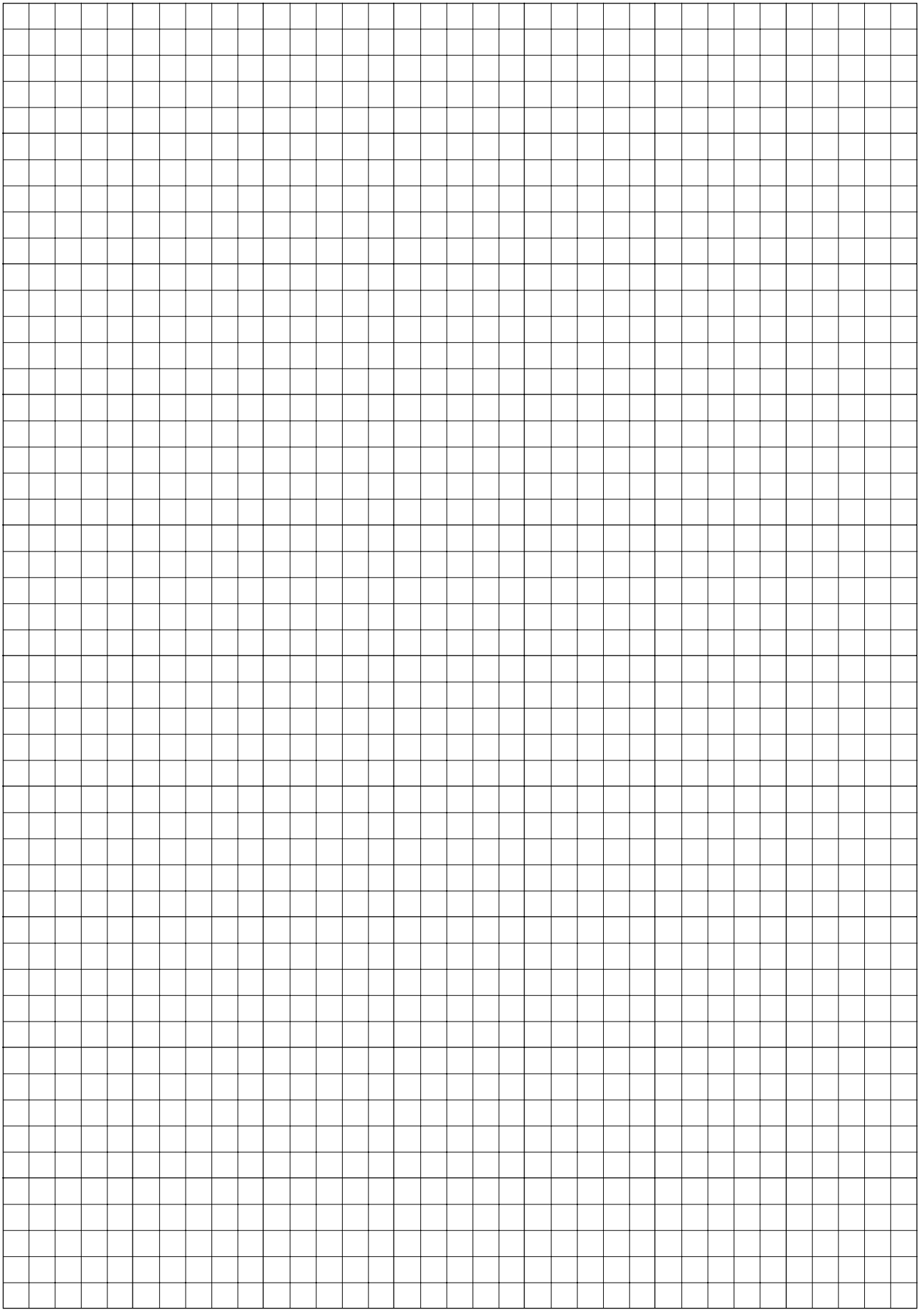

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The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS B

Friday, June 20, 2003 — 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

Notes to raters. . .

- **Each paper should be scored by a minimum of three raters.**
- **The table for converting the total raw score to the scaled score is provided in the scoring key for this examination.**
- **The scaled score is the student's final examination score.**

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FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

MATHEMATICS B

Friday, June 20, 2003 — 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 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 printed at the end of this key. The student's scaled score should be entered in the box provided on the student's detachable answer sheet. The scaled score is the student's final examination score.

Part I

Allow a total of 40 credits, 2 credits for each of the following. Allow credit if the student has written the correct answer instead of the numeral 1, 2, 3, or 4.

(1) 1	(6) 4	(11) 3	(16) 2
(2) 2	(7) 2	(12) 1	(17) 2
(3) 4	(8) 3	(13) 2	(18) 3
(4) 1	(9) 2	(14) 4	(19) 4
(5) 3	(10) 3	(15) 4	(20) 1

Part II

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

(21) **[2]** 1.4, and appropriate work is shown, such as finding the axis of symmetry.

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

or

[1] 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.

(22) **[2]** 255, and appropriate work is shown, such as $g(3) = 3^2 - 1$ and $f(8) = 2^8 - 1 = 255$.

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

or

[1] One conceptual error is made, such as evaluating $(g \circ f)(3)$.

or

[1] 255, 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]** 30, and appropriate work is shown.

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

or

[1] 30, but no work is shown.

[0] Direct variation is used to find a solution.

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]** Mean = 31 and standard deviation = 3.2, and appropriate work is shown.

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

or

[1] Either the mean or the standard deviation is determined correctly, and appropriate work is shown.

or

[1] Mean = 31 and standard deviation = 3.2, but no work is shown.

[0] Mean = 31 *or* standard deviation = 3.2, 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.

(25) **[2]** $\frac{-x-3}{10x+2}$ or an equivalent answer in simplest form, and appropriate work is shown.

[1] Either the numerator or the denominator is factored completely.

or

[1] Appropriate work is shown, but $\frac{3-x}{x-3} = -1$ is not recognized.

or

[1] $\frac{-x-3}{10x+2}$ or an equivalent answer in simplest form, 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]** 50, and appropriate work is shown, such as $2(1 + 3 + 5 + 7 + 9)$.

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

or

[1] Appropriate work is shown, but $(1 + 3 + 5 + 7 + 9)$ is not multiplied by 2, resulting in an answer of 25.

or

[1] 50, 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.

(27) **[4]** Appropriate work is shown, and an appropriate concluding statement is made to prove quadrilateral *ABCD* is a rhombus.

[3] The proof is completed appropriately, but one computational error is made, but an appropriate concluding statement is made.

or

[3] Appropriate work is shown to prove quadrilateral *ABCD* is a rhombus, but the concluding statement is missing, incomplete, or incorrect.

[2] The proof is completed appropriately, but more than one computational error is made, but an appropriate concluding statement is made.

or

[2] Appropriate work is shown, but one of the formulas used is incorrect.

or

[2] Appropriate work is shown to prove quadrilateral *ABCD* is a parallelogram, and an appropriate concluding statement is made, but the sides are not proved to be equal.

or

[2] Quadrilateral *ABCD* is proved to be a rhombus by assuming quadrilateral *ABCD* is a parallelogram.

[1] Appropriate work is shown to prove quadrilateral *ABCD* is a parallelogram, and the concluding statement is missing, incomplete, or incorrect.

or

[1] The definition of a rhombus is stated, but no proof is given.

[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]** 9 and 26, and appropriate work is shown, such as graphing and labeling the equations and identifying the points of intersection.

[3] Both functions are graphed correctly, and the points of intersection are indicated, but the prices are not stated.

or

[3] The parabola is graphed correctly, but the line is graphed incorrectly, but appropriate prices are stated.

[2] The line and the parabola are graphed and labeled, but a conceptual error is made, such as only one price is found because the graph of the parabola is incomplete.

or

[2] The line is graphed correctly, but the parabola is graphed incorrectly, but appropriate prices are stated.

or

[2] 9 and 26, but only an algebraic solution is shown.

[1] Both the line and the parabola are graphed incorrectly, but appropriate prices are stated.

or

[1] 9 and 26, but no work is shown.

[0] 9 *or* 26, 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.

(29) **[4]** Two, and the paths are sketched and labeled correctly, and appropriate work is shown.

[3] Appropriate work is shown, but one computational or graphing error is made, but the appropriate number of points of intersection is stated.

or

[3] Only one path is sketched correctly, but the correct interval is used, and an appropriate number of points of intersection is stated.

or

[3] The paths are sketched correctly, but an incorrect interval is used, but the appropriate number of points of intersection is stated.

or

[3] The paths are sketched correctly in the correct interval, but the number of points of intersection is not stated or is stated incorrectly.

[2] Appropriate work is shown, but more than one computational or graphing error is made, but the appropriate number of points of intersection is stated.

or

[2] Only one path is sketched correctly in the correct interval, and the number of points of intersection is not stated or is stated incorrectly.

or

[2] Only one path is sketched appropriately in an incorrect interval, but an appropriate number of points of intersection is stated.

[1] A basic sine and cosine curve are sketched, but they do not have the correct traits of the equation, but an appropriate number of points of intersection is stated.

or

[1] One path is sketched correctly in the correct interval, but the second graph is not sketched.

[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]** 11,052 and 14, and appropriate work is shown.

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

or

[3] 14, and appropriate work is shown, but the amount of money he will have after 2 years is not found.

[2] Appropriate work is shown, but more than one computational or rounding error is made.

or

[2] 11,052, and appropriate work is shown, and a correct log equation, such as log 2 = .05x log 2.718 is written, but it is not solved.

[1] 11,052, and appropriate work is shown, but the number of years to double his investment is not found or is found incorrectly.

or

[1] Appropriate substitutions are made for both equations, but neither equation is solved.

or

[1] 11,052 and 14, but no work is shown.

[0] 11,052 *or* 14, 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]** $\frac{1,472}{78,125}$, and appropriate work is shown, such as ${}_7C_6 \left(\frac{2}{5}\right)^6 \left(\frac{3}{5}\right)^1 + {}_7C_7 \left(\frac{2}{5}\right)^7 \left(\frac{3}{5}\right)^0$.

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

or

[3] The probabilities for exactly six times and exactly seven times are calculated correctly, but they are not added.

or

[3] The probability for at most six times is calculated correctly.

[2] Appropriate work is shown, but more than one computational error is made.

or

[2] Appropriate work is shown, but one conceptual error is made, such as multiplying the probabilities.

[1] A correct expression is written for finding the probability, but no further correct work is shown.

or

[1] The probability for exactly six times is calculated correctly.

or

[1] $\frac{1,472}{78,125}$, 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]** 91.5, and appropriate work is shown, such as using the Law of Sines to find either side of the obtuse triangle and then using the sine function to find the height of the lighthouse.

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

or

[3] The angles in the obtuse triangle are found incorrectly, but appropriate work is shown, and an appropriate height of the lighthouse is found.

[2] Appropriate work is shown, but more than one computational or rounding error is made.

or

[2] A correct length of a side of the obtuse triangle is found, but no further correct work is shown.

[1] An appropriate equation is set up for one triangle, but it is not solved.

or

[1] 91.5, but no work is shown.

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

Part IV

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

(33) **[6]** 2,700, and appropriate work is shown, such as using the Law of Cosines and finding the area of the triangle.

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

[4] Appropriate work is shown, but more than one computational or rounding error is made.

or

[4] Appropriate work is shown, and the area of the triangle is determined correctly, but the dollar amount is not determined or is determined incorrectly.

or

[4] The Law of Cosines is used correctly to determine an angle, but an incorrect procedure is used to find the area, but an appropriate dollar amount is found.

or

[4] The Law of Cosines is used incorrectly to determine an angle, but a correct procedure is used to find the area, and an appropriate dollar amount is found.

[3] The Law of Cosines is used correctly to determine an angle, but an incorrect procedure is used to find the area, and the dollar amount is not determined or is determined incorrectly.

[2] The Law of Cosines is used correctly to determine an angle, but no further correct work is shown.

[1] A correct equation using the Law of Cosines is written, but no further correct work is shown.

or

[1] 2,700, but no work is shown.

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

(34) *a* **[2]** Both circles are drawn and labeled correctly.

[1] Both circles are drawn, but one conceptual error is made.

or

[1] Only one circle is drawn and labeled correctly.

b **[4]** 0.7722345326 or an equivalent decimal answer, and appropriate work is shown, such as $\frac{400 - 29\pi}{400}$.

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

or

[3] The probability that point (x,y) lies inside the circles is found, and appropriate work is shown.

[2] Appropriate work is shown, but more than one computational or rounding error is made.

or

[2] Only the correct areas of the square and the circles are found.

[1] Only the correct area of the square or the circles is found.

or

[1] 0.7722345326 or an equivalent answer, but no work is shown.

a and *b*

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

Regents Examination in Mathematics B

June 2003

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

To determine the student's final examination score, find the student's total test raw score in the column labeled "Raw Score" and then locate the scaled score that corresponds to that raw score. The scaled score is the student's final examination score. Enter this score in the space labeled "Scaled Score" on the student's answer sheet.

All student answer papers that receive a scaled score of 60 through 64 **must** be scored a second time. For the second scoring, a different committee of teachers may score the student's paper or the original committee may score the paper, except that no teacher may score the same open-ended questions that he/she scored in the first rating of the paper. The school principal is responsible for assuring that the student's final examination score is based on a fair, accurate, and reliable scoring of the student's answer paper.

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