The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

THREE-YEAR SEQUENCE FOR HIGH SCHOOL MATHEMATICS

COURSE I

Tuesday, January 22, 2002 — 1:15 to 4:15 p.m., only

Notice . . .

Scientific calculators must be available to all students taking this examination.

The last page of the booklet is the answer sheet. Fold the last page along the perforations and, slowly and carefully, tear off the answer sheet. Then fill in the heading of the answer sheet.

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. The answer sheet cannot be accepted if you fail to sign this declaration.

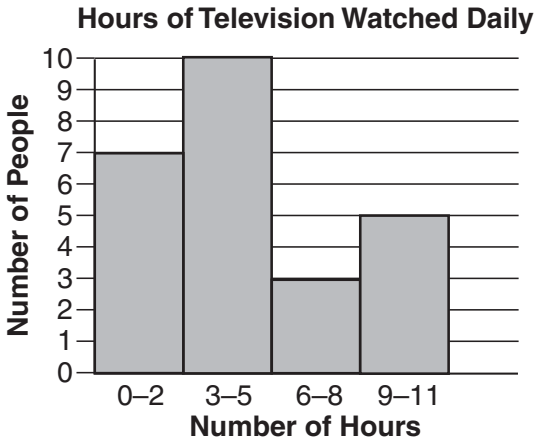
DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN.

Part I

Answer 30 questions from this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Write your answers in the spaces provided on the separate answer sheet. Where applicable, answers may be left in terms of π or in radical form. [60]

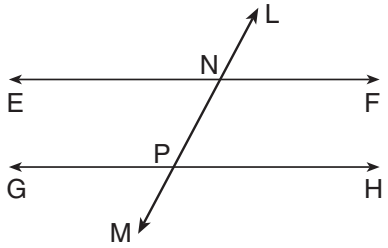
1 Solve for n: $5n - 1 = 3n + 5$

2 Casey talked to everyone in his apartment building to find out how many hours of television each person watched each day. The results are shown in the histogram below. Using the histogram, determine the total number of people in Casey's building.



3 If t varies directly as s, and $s = 15$ when $t = 12$, find s when $t = 4$.

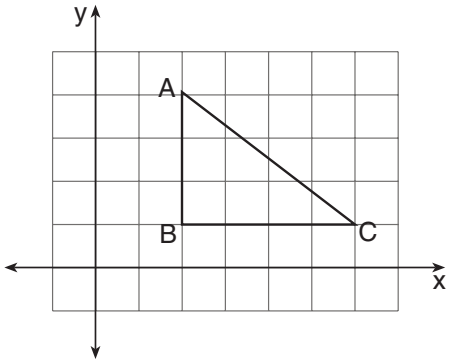
4 In the accompanying diagram, parallel lines $\overleftrightarrow{EF}$ and $\overleftrightarrow{GH}$ are cut by transversal $\overleftrightarrow{LM}$ at N and P, respectively. If $m\angle LNF = 62$, find $m\angle NPG$.



5 Express $\frac{x}{10} + \frac{3x}{5}$ as a single fraction in simplest form.

6 Shannon's pencil box contains four pens, two markers, and five pencils. Find the probability that an item chosen at random is a pen or a marker.

7 In the accompanying diagram, $\triangle ABC$ has coordinates $A(2,4)$, $B(2,1)$, and $C(6,1)$. Find the area of $\triangle ABC$.



8 Solve for x: $0.5x + 0.5 = 11.5$

9 Solve for x in terms of c and d: $3x - d = c$

10 Food and drink choices in a cafeteria include three different sandwiches, two different drinks, and five different desserts. What is the total number of different meals consisting of one sandwich, one drink, and one dessert that can be ordered?

11 A soccer team won nine games and lost three games. What percent of the total games played did the team win?

12 For what value of x is the expression $\frac{7}{x+8}$ undefined?

13 Find the value of $4ab^2$ if $a = 2$ and $b = 3$.

Directions (14–35): For *each* question chosen, write on the separate answer sheet the *numeral* preceding the word or expression that best completes the statement or answers the question.

14 If a number is selected at random from the set {–3,–2,–1,0,1,2,3}, what is the probability that the number is odd?

(1) $\frac{2}{7}$ (3) $\frac{4}{7}$

(2) $\frac{3}{7}$ (4) $\frac{5}{7}$

15 Expressed in simplest form, $\frac{12a^3c}{4ac}$ is equivalent to

(1) $8a^2$ (3) $3a^2c$

(2) $3a^2$ (4) $3a^3c$

16 What is the probability of a team losing a game if the probability of the team winning a game is 0.735?

(1) 1 (3) 1.265

(2) 0 (4) 0.265

17 Which ordered pair is the solution set for the system of equations below?

$$2x + y = 18$$
$$x - y = -6$$

(1) (4,10) (3) (8,3)

(2) (4,–10) (4) (6,12)

18 If $n + 6$ represents a positive odd integer, the next larger positive odd integer is represented by

(1) $n + 4$ (3) $2(n + 6)$

(2) $n + 8$ (4) $n + 7$

19 A rectangle is 4 inches wide and 9 inches long. What is the length of a diagonal of this rectangle, to the *nearest tenth of an inch*?

(1) 97.0 (3) 9.8

(2) 9.9 (4) 8.1

20 Which expression represents an irrational number?

(1) $\frac{1}{4}$ (3) $\sqrt{16}$

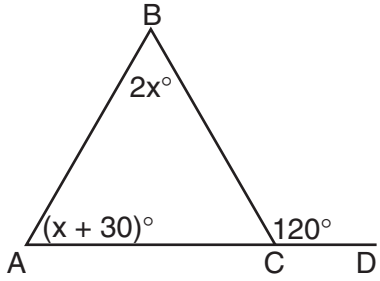
(2) 0 (4) $\sqrt{7}$

21 What is the value of x in the inequality $14 \geq 3x + 2$?

(1) $-4 \geq x$ (3) $4 \geq x$

(2) $-4 \leq x$ (4) $4 \leq x$

22 In the accompanying diagram of $\triangle ABC$, $\angle BCD$ is an exterior angle formed by extending $\overline{AC}$ to D, $m\angle A = x + 30$, $m\angle B = 2x$, and $m\angle BCD = 120$.



What is the value of x?

(1) 20 (3) 60

(2) 30 (4) 90

23 Which trinomial is equivalent to $(3x - 1)(x + 4)$?

(1) $3x^2 + 11x - 4$ (3) $3x^2 - 11x + 4$

(2) $3x^2 + 13x - 4$ (4) $3x^2 + 11x + 4$

24 Which equation represents a line with a slope of –3 and a y-intercept of 1?

(1) $y = x - 3$ (3) $x = y - 3$

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

25 The accompanying frequency table shows data collected by the weather bureau for the daily high temperatures in January in Buffalo.

Interval (temperature)	Frequency
30–39	13
20–29	6
10–19	5
0–9	7

Which interval contains the median temperature?

(1) 0–9 (3) 20–29

(2) 10–19 (4) 30–39

26 The multiplicative inverse of $\frac{2}{3}$ is

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

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

27 What is the inverse of the statement "If it is spring, then flowers bloom"?

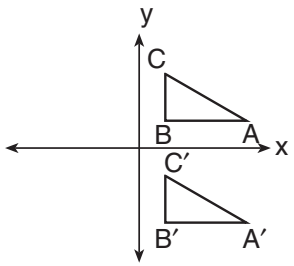
(1) If it is not spring, then flowers do not bloom.
(2) If it is not spring, then flowers bloom.
(3) If flowers do not bloom, then it is not spring.
(4) If flowers bloom, then it is spring.

28 What is the volume of a cube whose edge is 3?

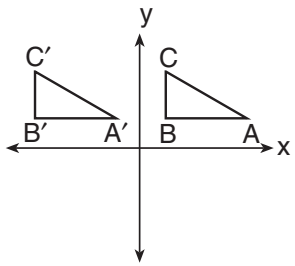
(1) 6 (3) 12

(2) 9 (4) 27

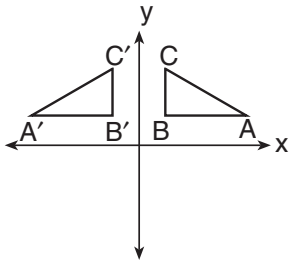
29 Which graph shows a reflection of $\triangle ABC$ in the x-axis?



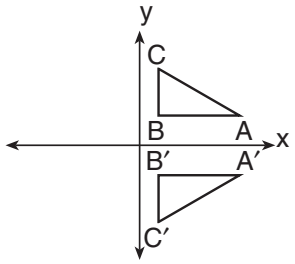
(1)



(3)



(2)



(4)

30 If the length of a rectangle is represented by $4n + 2$ and the width is represented by $3n + 1$, which algebraic expression can be used to represent the perimeter of the rectangle?

(1) $14n + 6$ (3) $20n$

(2) $7n + 3$ (4) $12n^2 + 10n + 2$

31 The factors of $2n^2 - 6n$ are

(1) $2n$ and $6n$ (3) $(2n - 1)$ and $(n - 3)$

(2) $2n$ and $(n - 3)$ (4) $(2n - 1)$ and $(1 - 3n)$

32 Quadrilateral $MATH$ is a rhombus. If $m\angle M = 72$, what is $m\angle T$?

(1) 288 (3) 72

(2) 108 (4) 18

33 If the area of circle O is 100π, the length of the radius of the circle is

(1) π (3) 50

(2) 10 (4) 100

34 Which statement should be the heading for the last column in the table below?

p	*q*	*?*
T	T	F
T	F	F
F	T	F
F	F	T

(1) $\sim p \wedge \sim q$ (3) $\sim p \vee \sim q$

(2) $p \rightarrow q$ (4) $\sim p \leftrightarrow q$

35 Which letter has point symmetry but *not* line symmetry?

(1) A (3) X

(2) I (4) Z

Answers to the following questions are to be written on paper provided by the school.

Part II

Answer four questions from this part. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Calculations that may be obtained by mental arithmetic or the calculator do not need to be shown. [40]

36 Solve the following system of equations graphically and check:

$$y = \frac{2}{3}x - 6$$
$$y + x = -1$$
[8,2]

37 The freshman class at Boomtown High School raised $930 from the sale of tickets to the spring dance. Tickets were $3.50 if purchased in advance and $5.00 if purchased at the door. If 225 tickets were sold, what is the total number of tickets sold at the door? [*Show or explain the procedure used to obtain your answer.*] [10]

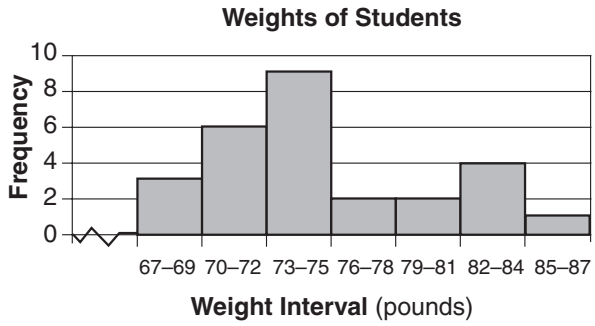
38 Solve the following system of equations algebraically and check:

$$3x = y + 4$$
$$x - y = 6$$
[8,2]

39 Find three positive consecutive integers such that the product of the first and second is 2 more than 9 times the third. [*Only an algebraic solution will be accepted.*] [4,6]

40 The width of a rectangle is 3 less than its length. If the length is multiplied by 2 and the width is increased by 4, the perimeter of the new rectangle is 50. Find the dimensions of the new rectangle. [*Only an algebraic solution will be accepted.*] [6,4]

41 The frequency histogram below shows the weights, in pounds, of the students in a sixth grade class.



a According to the frequency histogram, in which interval does the median fall? [2]

b What is the probability that the weight of a student chosen at random will be greater than 75 pounds? [2]

c *On your answer paper*, copy and complete the cumulative frequency table below. [2]

Weight Interval (pounds)	Cumulative Frequency
67–69	3
67–72	
67–75	
67–78	
67–81	
67–84	
67–87	

d Using the table completed in part *c*, construct a cumulative frequency histogram. [4]

GO RIGHT ON TO THE NEXT PAGE.➪

42 *On your answer paper,* copy and complete the truth table for the statement $\sim(p \vee q) \leftrightarrow (\sim p \wedge \sim q)$. [10]

p	q	$p \vee q$	$\sim(p \vee q)$	$\sim p$	$\sim q$	$\sim p \wedge \sim q$	$\sim(p \vee q) \leftrightarrow (\sim p \wedge \sim q)$

Tear Here

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

SEQUENTIAL MATH – COURSE I

Tuesday, January 22, 2002 — 1:15 to 4:15 p.m., only

Part I Score	. . . . .
Part II Score	. . . . .
Total Score	. . . . .
Rater's Initials:	. . . . .

ANSWER SHEET

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

Teacher . . . . . School . . . . .

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

Part I

Answer 30 questions from this part.

1	11	21	31 . . . . .
2	12	22	32 . . . . .
3	13	23	33 . . . . .
4	14	24	34 . . . . .
5	15	25	35 . . . . .
6	16	26	
7	17	27	
8	18	28	
9	19	29	
10	20	30	

Your answers for Part II should be placed on paper provided by the school.

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

Tear Here

Tear Here

FOR TEACHERS ONLY

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

THREE-YEAR SEQUENCE FOR HIGH SCHOOL MATHEMATICS

COURSE I

Tuesday, January 22, 2002 — 1:15 to 4:15 p.m., only

SCORING KEY

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.

Part I

Allow a total of 60 credits, 2 credits for each of 30 of the following. [If more than 30 are answered, only the first 30 answered should be considered.] Allow no partial credit. For questions 14–35, allow credit if the student has written the correct answer instead of the numeral 1, 2, 3, or 4.

(1) 3

(2) 25

(3) 5

(4) 118

(5) $\frac{7x}{10}$

(6) $\frac{6}{11}$

(7) 6

(8) 22

(9) $\frac{c + d}{3}$

(10) 30

(11) 75

(12) –8

(13) 72

(14) 3

(15) 2

(16) 4

(17) 1

(18) 2

(19) 3

(20) 4

(21) 3

(22) 2

(23) 1

(24) 2

(25) 3

(26) 3

(27) 1

(28) 4

(29) 4

(30) 1

(31) 2

(32) 3

(33) 2

(34) 1

(35) 4

Part II

Please refer to the Department's publication *Guide for Rating Regents Examinations in Mathematics,* 1996 Edition. Care should be exercised in making deductions as to whether the error is purely a mechanical one or due to a violation of some principle. A mechanical error generally should receive a deduction of 10 percent, while an error due to a violation of some cardinal principle should receive a deduction ranging from 30 percent to 50 percent, depending on the relative importance of the principle in the solution of the problem.

(36) (3,–4) [8]
Check [2]

(37) 95 [10]

(38) (–1,–7) [8]
Check [2]

(39) Analysis [4]
10, 11, 12 [6]

(40) Analysis [6]
width = 9
length = 16 [4]

(41) *a* 73–75 [2]
b $\frac{9}{27}$ [2]

As a reminder . . .

Regents examinations based on the Sequential Mathematics, Course I, syllabus will not be offered after January 2002.

Regents examinations based on the Sequential Mathematics, Course II, syllabus will not be offered after January 2003.

Regents examinations based on the Sequential Mathematics, Course III, syllabus will not be offered after January 2004.