REGENTS HIGH SCHOOL EXAMINATION

THREE-YEAR SEQUENCE FOR HIGH SCHOOL MATHEMATICS

COURSE I

Thursday, August 12, 1999 — 8:30 to 11:30 a.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 your answer sheet.

When you have completed the examination, you must sign the statement printed at the end of the answer paper, 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 paper 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 If the probability that a yellow ball is selected from a box is $\frac{3}{8}$, what is the probability that a yellow ball is *not* selected from the box?
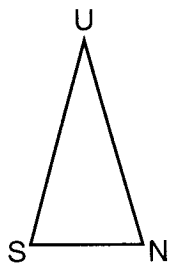
2 Find the value of $3x^2y$ when $x = 2$ and $y = -1$.

3 What is the sum of $(2a + 3b - 5)$ and $(5a - 3b - 1)$?

4 Let p represent "Christine went to the movies" and let q represent "Richard played lacrosse." Write in symbolic form: "Christine went to the movies or Richard did not play lacrosse."

5 Solve for x: $\frac{3}{4}x - 2 = 13$

6 In the accompanying diagram of $\triangle SUN$, $\overline{SU} \cong \overline{NU}$ and $m\angle U = 30$. Find the number of degrees in the measure of $\angle S$.

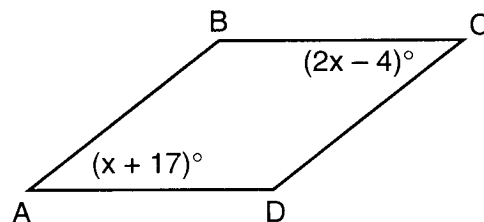7 Write the number 1.03×10^{-4} in decimal notation.

8 Solve the following system of equations for x:
$$3x + y = 14$$
$$2x - y = 16$$

9 A tree casts a shadow 36 feet long at the same time that a boy 5 feet tall casts a shadow 4 feet long. Find, in feet, the height of the tree.

10 In the accompanying diagram of parallelogram $ABCD$, $m\angle A = x + 17$ and $m\angle C = 2x - 4$. Find the value of x.

11 Factor: $x^2 - x - 12$

12 In the accompanying diagram, side $\overline{AC}$ of $\triangle ABC$ is extended through D, $m\angle B = 40$, and $m\angle A = 60$. Find $m\angle BCD$.
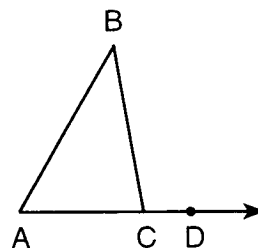
13 Find the area of a right triangle whose legs measure 5 and 12.

14 If y varies directly as x and $y = 5.4$ when $x = 3$, what is the value of y when $x = 5$?

15 Two vertical angles are complementary. Find the number of degrees in each angle.

16 Express $\frac{x}{3} + \frac{2x}{5}$ in simplest form.

17 Find the number of cubic units in the volume of a cube whose edge measures 4 units.

Directions (18–35): 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.

18 What type of symmetry does a square have?

(1) point symmetry, only
(2) line symmetry, only
(3) both point and line symmetry
(4) neither line nor point symmetry

19 If $3t^2$ and $-4t^3$ are multiplied, the product is

(1) $-12t^6$
(2) $-12t^5$
(3) $-7t^5$
(4) $-7t^6$

20 A baseball player successfully hits the ball 30% of the time. If he gets 450 chances to hit the ball in a season, what is the total number of times that he will successfully hit the ball?

(1) 30
(2) 135
(3) 420
(4) 1500
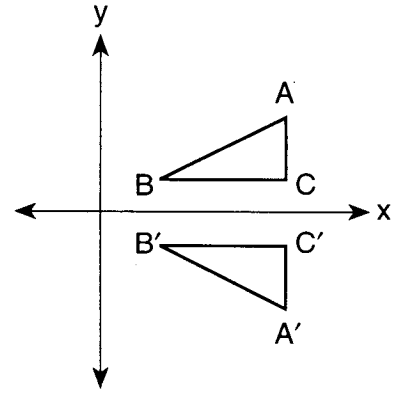
21 Which graph represents the graph of the equation $x = 2$?
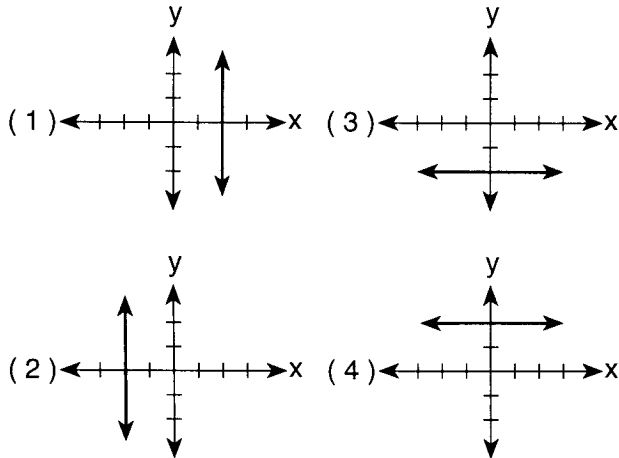
22 A set of data from an experiment is 36, 40, 40, 42, 44, 52, and 54. The mean of this set is

(1) 40
(2) 42
(3) 44
(4) 45

23 The expression $-6x - 7(4 + 3x)$ is equivalent to

(1) $3x - 28$
(2) $-9x - 28$
(3) $-21x - 4$
(4) $-27x - 28$

24 In the accompanying diagram, which transformation makes $\triangle A'B'C'$ the image of $\triangle ABC$?

(1) dilation
(2) translation
(3) rotation centered at the origin
(4) reflection in the x-axis

25 In the table below, which interval contains the median?

Interval	Frequency
80–100	2
60–79	3
40–59	4
20–39	2

(1) 80–100
(2) 60–79
(3) 40–59
(4) 20–39

26 The expression 7! is equal to

(1) $_7P_7$
(2) 7
(3) $_7P_2$
(4) 49
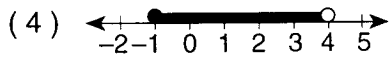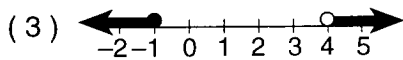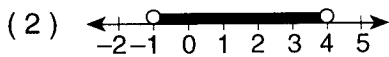
27 What is the slope of the line whose equation is $x + 2y = 6$?

(1) 1
(2) 2
(3) 6
(4) $-\frac{1}{2}$

28 Which statement is the converse of "If I pass this test, then I am happy"?

(1) If I am not happy, then I did not pass this test.
(2) If I am happy, then I pass this test.
(3) If I did not pass this test, then I am happy.
(4) If I did not pass this test, then I am not happy.

29 Which graph represents the inequality $-1 \leq x < 4$?

(1)

(2)

(3)

(4)
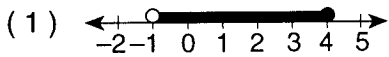
30 On a quiz taken by 28 students, a score of 74 is at the 25th percentile. How many students scored 74 or less?

(1) 7

(2) 14

(3) 21

(4) 24

31 The sum of $\sqrt{12}$ and $\sqrt{75}$ is

(1) $7\sqrt{3}$

(2) $29\sqrt{3}$

(3) $7\sqrt{6}$

(4) $\sqrt{87}$

32 In terms of c, y, and a, what is the value of x in the equation $2ax + 2y = c$?

(1) $\dfrac{(c - y)}{a}$

(2) $\dfrac{(c - 2y)}{2a}$

(3) $c - 2y - 2a$

(4) $\dfrac{(c + 2y)}{2a}$

33 Which monomial represents the perimeter of a square whose side measures $3x^2$?

(1) $6x^2$

(2) $12x^2$

(3) $9x^4$

(4) $12x^4$

34 What is the solution set for the equation $x^2 + 2x - 15 = 0$?

(1) $\{3,5\}$

(2) $\{-3,5\}$

(3) $\{3,-5\}$

(4) $\{-3,-5\}$

35 If the circumference of a circle is 10π, what is the area of the circle?

(1) 5π

(2) 10π

(3) 25π

(4) 100π

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 The frequency histogram below shows the daily temperature at 8:00 a.m. for the month of June at a local weather station.

Temperatures in June at 8:00 a.m.
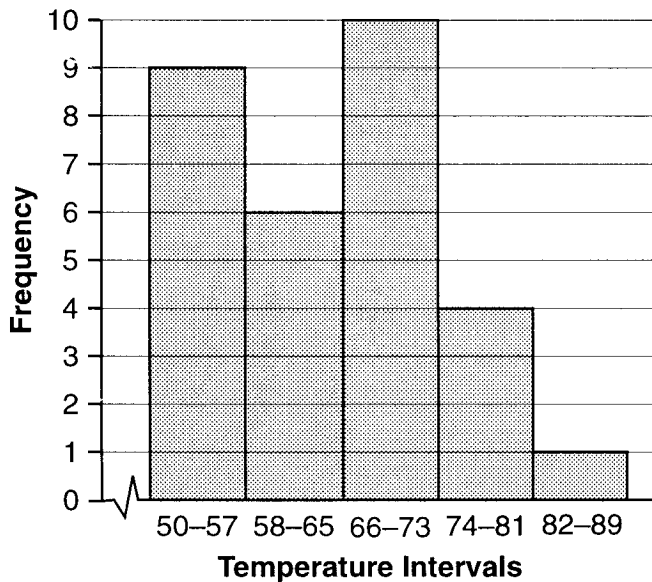
a *On your answer paper,* copy and complete the cumulative frequency table below. [2]

Temperature Intervals	Cumulative Frequency
50–57	
50–65	
50–73	
50–81	
50–89	

b Using the information from part *a*, construct a cumulative frequency histogram. [4]

c What is the maximum temperature possible at the 30th percentile? [2]

d What is the probability that on a day chosen at random the temperature at 8:00 a.m. was less than 74°? [2]

37 *a* On the same set of coordinate axes, graph the following system of inequalities.

$$2x + 3y < 9$$
$$y \geq 2x - 1$$ [8]

b Write the coordinates of a point that is *not* in the solution set of either inequality. [2]

38 *On your answer paper,* construct and complete a truth table for the statement

$(\sim p \vee q) \leftrightarrow (p \rightarrow \sim q)$. [10]

39 In the accompanying diagram, circle B is inscribed in square *MATH* and radius $BE = 5$.
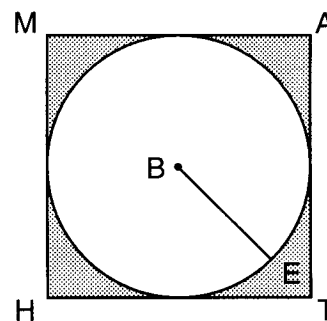
a Find the length of $\overline{MA}$. [2]

b Find the area of square *MATH*. [2]

c Find the length of diagonal $\overline{HA}$ in simplest radical form. [3]

d Find the area of the shaded region in terms of π. [3]

40 The Town Recreation Department ordered a total of 100 balls and bats for the summer baseball camp. Balls cost \$4.50 each and bats cost \$20.00 each. The total purchase was \$822.00. How many of each item were ordered? [*Use any method to arrive at your answer. Show all work.*] [10]

41 Solve the following system of equations algebraically and check:

$$4x = 5y + 35$$
$$6x + 7y = 9$$

[8,2]

42 What is the *smallest* of three positive consecutive odd integers if the product of the second and third integers is 63? [*Only an algebraic solution will be accepted.*]   [4,6]

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

SEQUENTIAL MATH – COURSE I

Thursday, August 12, 1999 — 8:30 to 11:30 a.m., only

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

ANSWER SHEET

Pupil . . . .   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 n.

FOR TEACHERS ONLY

THREE-YEAR SEQUENCE FOR HIGH SCHOOL MATHEMATICS

COURSE I

Thursday, August 12, 1999 — 8:30 to 11:30 a.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 18–35, allow credit if the student has written the correct answer instead of the numeral 1, 2, 3, or 4.

(1) $\frac{5}{8}$	(11) $(x + 3)(x - 4)$	(21) 1	(31) 1
(2) -12	(12) 100	(22) 3	(32) 2
(3) $7a - 6$	(13) 30	(23) 4	(33) 2
(4) $p \vee {\sim}q$	(14) 9	(24) 4	(34) 3
(5) 20	(15) 45	(25) 3	(35) 3
(6) 75	(16) $\frac{11x}{15}$	(26) 1	
(7) 0.000103	(17) 64	(27) 4	
(8) 6	(18) 3	(28) 2	
(9) 45	(19) 2	(29) 4	
(10) 21	(20) 2	(30) 1	

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) *c* 57 [2]

    d $\frac{25}{30}$ [2]

(39) *a* 10 [2]

    b 100 [2]

    c $10\sqrt{2}$ [3]

    d $100 - 25\pi$ [3]

(40) 76 balls

    24 bats [10]

(41) (5,–3) [8]

    Check [2]

(42) Analysis [4]

    5 [6]