

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

THREE-YEAR SEQUENCE FOR HIGH SCHOOL MATHEMATICS

COURSE I

Monday, June 16, 1980 — 1:15 to 4:15 p.m., only

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

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Part I

Answer 30 questions from this part. Each correct answer will receive 2 credits. 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.

1 Solve for x : $3x - 5 = 16$

2 Solve for r in terms of C and π : $C = 2\pi r$

3 The length of a rectangle is 8 centimeters and its width is 6 centimeters. Find the number of centimeters in the length of the diagonal.

4 How many different two-digit numbers can be made from the digits of 345 if a digit can appear just once in a number?

5 Find the radius of a circle whose area is 25π .

6 Find the numerical value of the expression $c + xy$ when $c = 3$, $x = 4$, and $y = -5$.

7 If a 6-sided die and a coin are tossed simultaneously, how many pairs (outcomes) are there in this sample space?

8 Express the product $(x - 3)(x + 3)$ as a binomial.

9 Solve for x : $0.2x + 0.3 = 8.1$

10 Solve for c : $\frac{1}{3}c + 2 = 4$

11 Find the sum of $3x^2 + 2x - 4$ and $2x^2 - 3x + 1$.

12 If 60% of a number is 144, what is the number?

13 Find the mode for the following data:
4, 5, 3, 4, 5, 3, 5

14 Solve for the positive value of x : $x^2 - 81 = 0$

15 Factor: $x^2 - 11x + 24$

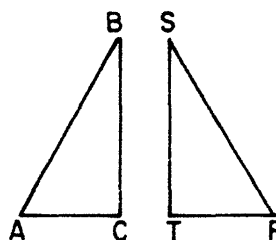
16 A farmer grew 105 bushels of grain on a 3-acre plot. How many bushels can he expect to grow under the same conditions on a 5-acre plot?

17 Solve the following system of equations for y :

$$\begin{aligned} 3x + 2y &= 7 \\ -3x + y &= 8 \end{aligned}$$

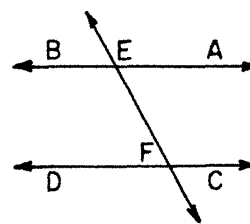
18 Let p represent, "You are correct," and let q represent, "I agree." Using p and q , write in symbolic form, "You are correct and I agree."

19 In the accompanying figure, triangle ABC is congruent to triangle RST , $\overline{AB} \cong \overline{RS}$, $\overline{BC} \cong \overline{ST}$, and $\overline{AC} \cong \overline{RT}$. What angle in triangle RST is congruent to $\angle BAC$?



20 The area of a triangle is 40 square centimeters. If the base of the triangle is 10 centimeters, find the number of centimeters in the height.

21 In the accompanying figure, \overleftrightarrow{AB} is parallel to \overleftrightarrow{CD} , and these lines are cut by the transversal \overleftrightarrow{EF} at points E and F , respectively. If the measure of $\angle AEF$ is 70° , find the number of degrees in the measure of $\angle DFE$.



22 If the heights in centimeters of five students are 176, 172, 160, 158, and 158, find the median height for this group of five students.

23 The probability we will win the baseball game is $\frac{3}{5}$.
What is the probability we will *not* win the game?

Directions (24–35): 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.

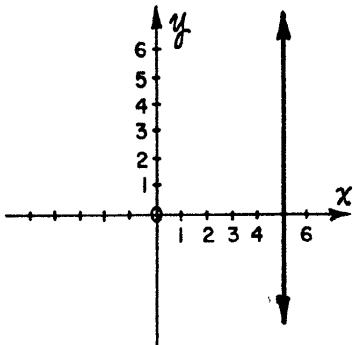
24 The expression $\frac{-12x^6y^2}{3x^2y}$ is equivalent to

- (1) $9x^3y^2$ (3) $-4x^3y$
 (2) $4x^4y$ (4) $-4x^4y$

25 Two complementary angles are in the ratio 4:5. What is the measure in degrees of the smaller angle?

- (1) 10 (3) 50
 (2) 40 (4) 80

26 The graph of which equation is shown in the accompanying diagram?



- (1) $x = 5$ (3) $y = 5x$
 (2) $y = 5$ (4) $y = x + 5$

27 The product $(3x^2y^2)(4xy^3)$ is

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

28 The expression $\sqrt{18} - \sqrt{2}$ is equivalent to

- (1) $8\sqrt{2}$ (3) 3
 (2) $2\sqrt{2}$ (4) 4

29 If the length of a rectangle is doubled and the width is also doubled, then the perimeter must be

- (1) doubled (3) increased by 4
 (2) increased by 2 (4) multiplied by 4

30 What is the inverse of the statement, "If I study, then I will pass"?

- (1) If I pass, then I did study.
 (2) If I do not pass, then I did not study.
 (3) If I do not study, then I will not pass.
 (4) If I study, then I will not pass.

31 If 2 six-sided dice are rolled, what is the probability of getting a sum of 3?

- (1) $\frac{1}{36}$ (3) $\frac{3}{36}$
 (2) $\frac{2}{36}$ (4) $\frac{2}{6}$

32 The graph of $3x - y = 3$ intersects the x -axis at the point

- (1) (1,0) (3) (0,3)
 (2) (0,1) (4) (3,0)

33 Let p represent: x is odd.

Let q represent: $x > 8$.

When x is 6, which is true?

- (1) p (3) $p \rightarrow q$
 (2) q (4) $p \wedge q$

34 Given the true statement, "If I live in Lake Placid, then I live in New York State." Which statement must also be true?

- (1) If I do not live in Lake Placid, then I do not live in New York State.
 (2) If I do not live in New York State, then I do not live in Lake Placid.
 (3) If I live in New York State, then I live in Lake Placid.
 (4) I live in Lake Placid and I do not live in New York State.

35 Which ordered pair is in the solution set of $y > 3x + 2$?

- (1) (1,5) (3) (5,1)
 (2) (1,6) (4) (0,0)

➡ GO RIGHT ON TO THE NEXT PAGE.

[OVER]

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

Part II

Answer four questions from this part. Show all work unless otherwise directed.

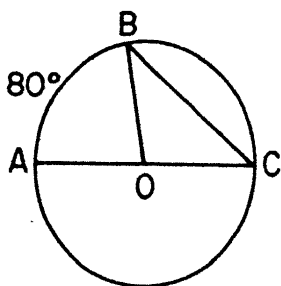
36 Solve graphically and check:

$$\begin{aligned} 2y &= x + 6 \\ 3x - y &= 2 \end{aligned} \quad [8,2]$$

37 In triangle ABC , the measures of angles A and B are in the ratio 1:3. Angle C is 5 degrees more than angle A . Find the number of degrees in each angle. [Only an algebraic solution will be accepted.] [5,5]

38 The square of a positive number is 42 more than the number itself. What is the number? [Only an algebraic solution will be accepted.] [5,5]

39 In the accompanying figure, \overline{AC} is a diameter of circle O . The measure of arc AB is 80° .



- a Find, in degrees, the measure of $\angle AOB$. [2]
- b Find, in degrees, the measure of $\angle ACB$. [2]
- c If the area of the circle is 49π , find the length of the radius. [2]
- d If the area of the circle is 49π , find the circumference of the circle in terms of π . [2]
- e Triangle COB is
 - (1) scalene (3) equilateral
 - (2) isosceles (4) right [2]

40 a On your answer paper, copy and complete the truth table for the statement $[(p \rightarrow q) \wedge \sim q] \rightarrow \sim p$. [8]

p	q	$p \rightarrow q$	$\sim q$	$(p \rightarrow q) \wedge \sim q$	$\sim p$	$[(p \rightarrow q) \wedge \sim q] \rightarrow \sim p$

- b Is $[(p \rightarrow q) \wedge \sim q] \rightarrow \sim p$ a tautology? [1]
- c Justify the answer you gave in part b. [1]

41 In a certain class, there are 4 students in the first row: three girls, Ann, Barbara, and Cathy, and one boy, David. The teacher called one of these students to the board to solve a problem. When the problem was done, the teacher called one of the remaining students in the first row to do a second problem at the board.

- a Draw a tree diagram or list the sample space of all possible pairs of names for calling two students to the board. [4]
- b Find the probability that the teacher called Ann first and Barbara second. [2]
- c Find the probability that the teacher called two girls to the board. [2]
- d Find the probability that David was one of the two students called. [2]

42 The following data are test scores for a class of 16 students: 96, 83, 91, 77, 58, 88, 80, 62, 89, 100, 87, 93, 64, 98, 88, 86.

a On your answer paper, copy and complete the table below. [2]

Interval	Number (frequency)
91-100	
81-90	
71-80	
61-70	
51-60	

- b On graph paper, construct a frequency histogram based on the data. [4]
- c Which interval contains the median? [2]
- d Which interval contains the lower quartile? [2]

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The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

SEQUENTIAL MATH — COURSE I

Monday, June 16, 1980 — 1:15 to 4:15 p.m., only

Part I Score:
Rater's Initials:

ANSWER SHEET

Pupil.....Teacher.....

School.....Grade.....

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

FOR TEACHERS ONLY

SCORING KEY

THREE-YEAR SEQUENCE FOR HIGH SCHOOL MATHEMATICS

COURSE I

Monday, June 16, 1980 — 1:15 to 4:15 p.m., only

Use only *red* ink or *red* pencil in rating Regents papers. Do not attempt to *correct* the pupil's work by making insertions or changes of any kind. Use checkmarks to indicate pupil 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.] For questions 24–35, allow credit if the pupil has written the correct answer instead of the numeral 1, 2, 3, or 4.

(1) 7	(11) $5x^2 - x - 3$	(21) 70	(31) 2
(2) $\frac{C}{2\pi}$	(12) 240	(22) 160	(32) 1
(3) 10	(13) 5	(23) $\frac{2}{5}$	(33) 3
(4) 6	(14) 9	(24) 4	(34) 2
(5) 5	(15) $(x - 8)(x - 3)$	(25) 2	(35) 2
(6) -17	(16) 175	(26) 1	
(7) 12	(17) 5	(27) 1	
(8) $x^2 - 9$	(18) $p \wedge q$	(28) 2	
(9) 39	(19) $\angle SRT$	(29) 1	
(10) 6	(20) 8	(30) 3	

[OVER]

SEQUENTIAL MATH-COURSE I — *concluded*

Part II

Please refer to the Department's pamphlet *Suggestions on the Rating of Regents Examination Papers in Mathematics*. 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.

(37) Analysis [5]

$$\angle A = 35^\circ$$

$$\angle B = 105^\circ \quad [5]$$

$$\angle C = 40^\circ$$

(41) $b \frac{1}{12}$ [2]

$$c \frac{6}{12} \quad [2]$$

$$d \frac{6}{12} \quad [2]$$

(38) Analysis [5]

$$7 \quad [5]$$

(39) $a \ 80$ [2]

$$b \ 40 \quad [2]$$

$$c \ 7 \quad [2]$$

$$d \ 14\pi \quad [2]$$

$$e \ 2 \quad [2]$$

(40) $b \ \text{yes}$ [1]

(42)

a

Interval	Number
91-100	5
81-90	6
71-80	2
61-70	2
51-60	1

[2]

$c \ 81-90$ [2]

$d \ 71-80$ [2]