The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

THREE-YEAR SEQUENCE FOR HIGH SCHOOL MATHEMATICS

COURSE I

Monday, January 25, 1988 — 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

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 x: $5(2x - 4) = 10$

2 Two angles of a triangle have measures of 30 and 55. Find the measure of the third angle.

3 Solve for x: $\frac{2x}{3} = \frac{8}{6}$

4 Solve for x: $0.15x = 5.25$

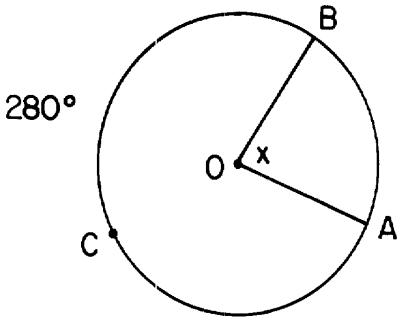
5 Alice has 6 dresses, 2 coats, and 3 hats. How many different outfits can she wear consisting of a dress, a coat, and a hat?

6 Let p represent "It is winter" and let q represent "I go swimming." Using p and q, write in symbolic form: "If I do *not* go swimming, then it is winter."

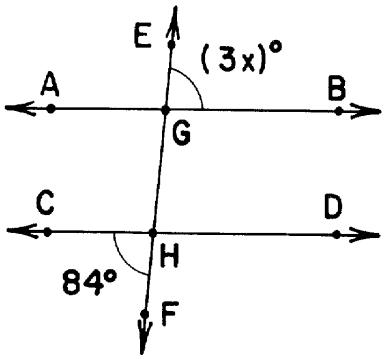
7 Solve for x: $5x - 21 = 8x - 30$

8 If 80% of a number is 24, what is the number?

9 In the accompanying diagram of circle O, arc ACB has a measure of 280. What is the measure of central angle x?



10 In the accompanying diagram, parallel lines $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ are intersected by transversal $\overleftrightarrow{EF}$ at points G and H, respectively. If the measure of angle EGB is $3x$ and the measure of angle CHF is 84, find the value of x.



11 If a number is picked at random from the set $\{1,2,3,4\}$, what is the probability that the number is a solution for $2x + 5 > 7$?

12 The perimeter of a square is $4x - 8$. Express the length of one side of the square in terms of x.

13 The sides of a triangle are 12, 15, and 20. If the shortest side of a similar triangle is 3, find the length of the longest side of that triangle.

14 Simplify by combining like terms:

$$(5a + 3b) + 2(a - 3b)$$

15 If the circumference of a circle is 28π, what is the radius of that circle?

16 Factor: $x^2 - 16x + 48$

17 Solve for x in terms of a, b, and c:

$$bx + c = a$$

18 Express the sum of $\frac{x}{3}$ and $\frac{x}{5}$ as a single fraction in lowest terms.

19 Express the product $(2x - 3)(x + 5)$ as a trinomial.

20 Solve the following system of equations for x:

$$3x + y = 11$$
$$2x - y = -1$$

21 Find the value of the expression $2xy^3$ if $x = 3$ and $y = -2$.

Directions (22–35): 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.

22 The quotient $\frac{16x^3y^5}{4xy^2}$ is equivalent to

(1) $4x^2y^3$
(2) $4xy^7$
(3) $12x^2y^3$
(4) $12x^3y^3$

23 In a class there are 11 boys and 14 girls. What is the ratio of the number of girls in the class to the number of pupils in the class?

(1) $\frac{11}{14}$
(2) $\frac{14}{11}$
(3) $\frac{14}{25}$
(4) $\frac{25}{14}$

24 For which group of data does the mean equal the mode?

(1) 4,4,5,6
(2) 4,5,6,6
(3) 4,5,5,6
(4) 4,5,5,8

25 If $p \vee q$ is false, then

(1) both p and q are true
(2) p is false and q is true
(3) p is true and q is false
(4) both p and q are false

26 If $V = \ell wh$, what is the value of V when $\ell = 2$, $w = 3$, and $h = 4x$?

(1) $9x$
(2) $24x$
(3) $5 + 4x$
(4) $6 + 4x$

27 If point $(b,4)$ is in the solution set of $3x + y = 13$, then the value of b must be

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

28 The value of $\frac{5!}{3!}$ is

(1) 20
(2) 2
(3) 5
(4) 4

29 The inverse of $p \rightarrow \sim q$ is

(1) $q \rightarrow \sim p$
(2) $q \rightarrow p$
(3) $\sim p \rightarrow \sim q$
(4) $\sim p \rightarrow q$

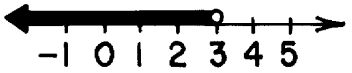
30 What is the slope of the line whose equation is $y = -3x + 6$?

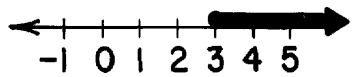
(1) $-\frac{1}{2}$
(2) 2
(3) -3
(4) 6

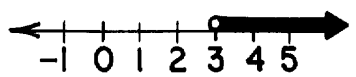
31 Which represents a rational number?

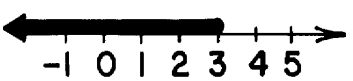
(1) π
(2) $\sqrt{16}$
(3) $\sqrt{15}$
(4) $\sqrt{\frac{100}{5}}$

32 Which graph represents the solution of the inequality $2x + 3 > 9$?

(1) 

(2) 

(3) 

(4) 

33 The solution set of $x^2 - 64 = 0$ is

(1) $\{8,-8\}$ (3) $\{8\}$

(2) $\{-8\}$ (4) $\{16,-4\}$

34 Which is equivalent to $4\sqrt{3}$?

(1) 144 (3) $\sqrt{19}$

(2) $\sqrt{48}$ (4) $\sqrt{16}$

35 Which expression is undefined if $x = 6$?

(1) x^0 (3) $\frac{1}{x + 6}$

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

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

Part II

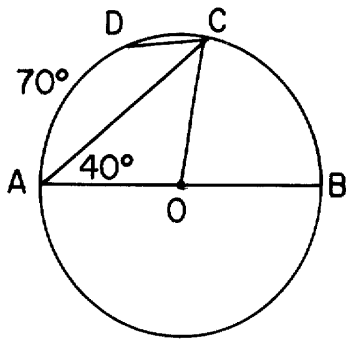
Answer four questions from this part. Show all work unless otherwise directed. [40]

36 Solve graphically and check:

$$2x + y = 5$$
$$x - 2y = 10$$ [8,2]

37 One integer is 4 more than three times another integer. The sum of the two integers is less than 21. Find the *largest* possible values for both integers. [*Only an algebraic solution will be accepted.*] [5,5]

38 In the accompanying diagram, $\overline{AB}$ is a diameter of circle O, the measure of $\angle BAC$ is 40, and the measure of $\overset{\frown}{AD}$ is 70.



a Find the measure of minor arc BC. [2]
b Find m$\angle BOC$. [2]
c Find m$\angle ACD$. [2]
d Find the measure of minor arc CD. [2]
e Find m$\angle AOC$. [2]

39 The length of the hypotenuse of a right triangle is 13. The length of the shorter leg is 7 less than the length of the longer leg. Find the length of the *shorter* leg. [*Only an algebraic solution will be accepted.*] [5,5]

40 In $\triangle ABC$, $\angle B$ is congruent to $\angle C$. The measure of $\angle B$ is 20 more than twice the measure of $\angle A$. Find the measure of *each* angle in $\triangle ABC$. [*Only an algebraic solution will be accepted.*] [6,4]

41 The table below represents the ages of high school principals in a large city.

Interval	Frequency
68–75	5
60–67	10
52–59	25
44–51	15
36–43	25
28–35	20

a Which interval contains the median? [2]
b If a principal is chosen at random, what is the probability that the age of the principal is in the interval 44–51? [2]
c What is the probability that the age of a principal is less than 44? [2]
d What is the probability that a principal is younger than 28? [2]
e What percent of the principals' ages are in the interval 52–59? [2]

☞ **GO RIGHT ON TO THE NEXT PAGE.**

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

p	q	$\sim p$	$\sim p \vee q$	$\sim q$	$p \rightarrow \sim q$	$q \wedge (p \rightarrow \sim q)$	$(\sim p \vee q) \longleftrightarrow [q \wedge (p \rightarrow \sim q)]$
T	T						
T	F						
F	T						
F	F						

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REGENTS HIGH SCHOOL EXAMINATION

SEQUENTIAL MATH — COURSE I

Monday, January 25, 1988 — 1:15 to 4:15 p.m., only

Part I Score	
Part II Score	
Total 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, January 25, 1988—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.] Allow no partial credit. For questions 22–35, allow credit if the pupil has written the correct answer instead of the numeral 1, 2, 3, or 4.

(1) 3

(2) 95

(3) 2

(4) 35

(5) 36

(6) $\sim q \rightarrow p$

(7) 3

(8) 30

(9) 80

(10) 28

(11) $\frac{3}{4}$

(12) $x - 2$

(13) 5

(14) $7a - 3b$

(15) 14

(16) $(x - 4)(x - 12)$

(17) $\frac{a - c}{b}$

(18) $\frac{8x}{15}$

(19) $2x^2 + 7x - 15$

(20) 2

(21) -48

(22) 1

(23) 3

(24) 3

(25) 4

(26) 2

(27) 3

(28) 1

(29) 4

(30) 3

(31) 2

(32) 3

(33) 1

(34) 2

(35) 4

[OVER]

Part II

Please refer to the Department publication *Guide for Rating Regents Examinations 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]
4, 16 [5]

(38) *a* 80 [2]
b 80 [2]
c 35 [2]
d 30 [2]
e 100 [2]

(39) Analysis [5]
5 [5]

(40) Analysis [6]
28, 76, 76 [4]

(41) *a* 44–51 [2]
b $\frac{15}{100}$ [2]
c $\frac{45}{100}$ [2]
d 0 [2]
e 25 [2]