

New York State Education Department
Integrated Sequence for High School Mathematics

Course I

Final Examination

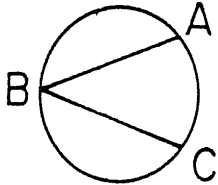
In Lieu of the Ninth Year Mathematics Regents Examination

Wednesday, August 15, 1979, a.m.

Part I

Answer only 30 of the 35 questions in 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 : $3x - 2 = 16$
- 2 Find the value of the expression $2x^2y$ when $x = -1$ and $y = 3$.
- 3 Solve for x :
 $3x + y = 9$
 $2x + y = 7$
- 4 Jane's test grades were 75, 83, 87, 90, and 90. What is the median of these grades?
- 5 One side of a square is represented by $x + 3$. Express the perimeter of the square in terms of x .
- 6 Let p represent "He likes mathematics." Let q represent "He likes ice cream." Write, in symbolic form, using p and q :
"He likes mathematics and he does not like ice cream."
- 7 A bicycle costs \$120. The sales tax rate is 7%. What is the amount of money paid for tax?
- 8 Factor completely: $x^2 + 8x + 15$
- 9 Find the sum of $4a + 2b - c$ and $3a - 5b - 2c$.
- 10 A tree casts a shadow 20 meters long at the same time that a man 2 meters tall casts a shadow of 5 meters. How many meters are in the height of the tree?
- 11 A cafeteria sells 5 kinds of sandwiches, 3 kinds of beverages, and 4 kinds of desserts. How many possible lunches consisting of one sandwich, one beverage, and one dessert can be chosen?
- 12 Two complementary angles are in the ratio of 1:2. Find the number of degrees in the measure of the smaller angle.

- 13 The legs of a right triangle have lengths of 2 and 7. Express, in radical form, the length of the hypotenuse.
- 14 If the vertex angle of an isosceles triangle measures 80° , find the number of degrees in the measure of one of the base angles.
- 15 In the accompanying figure, the measure of inscribed angle ABC is 40° . Find the number of degrees in the measure of arc AC.
- 
- 16 A single die is tossed once. What is the probability of obtaining a number greater than 4?
- 17 Simplify: $\sqrt{50} + 3\sqrt{2}$
- 18 Find the radius of a circle if its area is 49π .
- 19 If 7 is subtracted from four times a certain number, the difference is 25. What is the number?
- 20 What is the slope of the line whose equation is $y = 4x + 12$?

Directions (21-35): 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.

- 21 When $2x^2y$ is multiplied by $3x^3y^4$, the product is
- | | |
|---------------|---------------|
| (1) $5x^5y^5$ | (3) $5x^6y^4$ |
| (2) $6x^5y^5$ | (4) $6x^6y^4$ |
- 22 If the point $(k, 3)$ lies on the graph of $x + 3y = 15$, what is the value of k ?
- | | |
|-------|-------|
| (1) 6 | (3) 3 |
| (2) 5 | (4) 4 |
- 23 From an ordinary deck of 52 cards, one card is drawn. What is the probability that it will be either an ace or a king?
- | | |
|--------------------|---------------------|
| (1) $\frac{2}{52}$ | (3) $\frac{8}{52}$ |
| (2) $\frac{4}{52}$ | (4) $\frac{26}{52}$ |
- 24 A bag contains 5 red and 4 white marbles. One marble is drawn, its color noted and returned. A second marble is drawn and its color noted. What is the probability that both marbles are red?
- | | |
|---------------------|---------------------|
| (1) $\frac{25}{72}$ | (3) $\frac{25}{81}$ |
| (2) $\frac{20}{72}$ | (4) $\frac{16}{81}$ |

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

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

26 Given the true statement: "If it is August, then I will go on vacation." Which statement must also be true?

- (1) If I go on vacation, then it is August.
- (2) If I do not go on vacation, then it is not August.
- (3) If it is not August, then I do not go on vacation.
- (4) If it is August, then I do not go on vacation.

27 Which should be the heading for Column 3?

Column 1	Column 2	Column 3
p	q	
T	T	T
T	F	F
F	T	T
F	F	T

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

28 The area of a triangle is $\frac{1}{2}bh$. If the base of the triangle is doubled and the height of the triangle is doubled, then the area is

- (1) doubled
- (2) multiplied by 4
- (3) multiplied by 8
- (4) increased by 4

29 Which is the solution set of $x^2 - 3x - 10 = 0$?

- (1) $\{-5, 2\}$
- (2) $\{5, -2\}$
- (3) $\{2, 5\}$
- (4) $\{-2, -5\}$

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

Part II

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

36 Answer either a or b but not both.

a Solve graphically and check:

$$\begin{aligned} y &= x + 7 \\ 2x + y &= 1 \end{aligned} \quad [8, 2]$$

OR

b Graph the following system of inequalities and label the solution set A:

$$\begin{aligned} y &\geq 3x + 1 \\ y &< x + 1 \end{aligned} \quad [8, 2]$$

37 The length of a rectangle is 2 less than twice the width. If the perimeter of the rectangle is 92, find the numerical value of both the length and the width of the rectangle. [Only an algebraic solution will be accepted.] [5,5]

38 a On your answer paper, copy and complete the truth table for the statement:

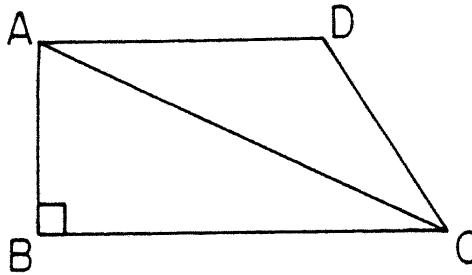
$$(q \rightarrow \sim p) \leftrightarrow \sim(p \wedge q) \quad [8]$$

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

b Is $(q \rightarrow \sim p) \leftrightarrow \sim(p \wedge q)$ a tautology? [1]

c Give a reason for your answer to part b. [1]

- 39 In the accompanying figure, \overline{AB} is the height in trapezoid $ABCD$, $AB = 5$, $BC = 12$ and $AD = 8$. Diagonal \overline{AC} is drawn.



- a Find AC . [3]
- b Find the area of trapezoid $ABCD$. [3]
- c Find the area of triangle ABC . [2]
- d Find the area of triangle ACD . [2]
- 40 A silver dollar, a half-dollar, a quarter, a dime, and a nickel are in a box. One coin is drawn. Without replacing the first coin, a second coin is drawn.
- a Draw a tree diagram or list the sample space of all possible pairs that are outcomes for this experiment. [4]
- b What is the probability that the value of the first coin drawn is greater than the value of the second coin drawn? [2]
- c What is the probability that the value of the two coins drawn is greater than \$1.00? [2]
- d What is the probability that the sum of the values of the two coins drawn is exactly \$1.00? [2]

- 41 The following data represents the distribution of test grades of students on a math test:

Grade	Number (Frequency)
60	1
65	1
70	1
75	2
80	3
85	4
90	2
95	1
100	0

- a Find the total frequency. [2]
- b Find the mode. [2]
- c Find the median. [2]
- d Find the mean. [4]
- 42 One positive number is 4 more than another. The sum of their squares is 40. Find the numbers. (Only an algebraic solution will be accepted.) [5, 5]

Part I Score _____

New York State Education Department
 Three-year Sequence for High School Mathematics
 Course I
 Answer Sheet

Wednesday, August 15, 1979, a.m.

Pupil....., Teacher.....
 School.....

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

Part I

Answer 30 questions in this part.

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

[OVER]

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

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For Teachers Only

Scoring Key

Three-year Sequence for High School Mathematics

Course I

Wednesday, August 15, 1979 - a.m.

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 21-35, allow credit if the pupil has written the correct answer instead of the numeral 1,2,3, or 4.

(1) 6	(11) 60	(21) 2	(31) 1
(2) 6	(12) 30	(22) 1	(32) 4
(3) 2	(13) $\sqrt{53}$	(23) 3	(33) 3
(4) 87	(14) 50	(24) 3	(34) 1
(5) $4x + 12$	(15) 80	(25) 4	(35) 2
(6) $p \wedge \sim q$	(16) $\frac{1}{3}$	(26) 2	
(7) \$8.40	(17) $8\sqrt{2}$	(27) 3	
(8) $(x + 5)(x + 3)$	(18) 7	(28) 2	
(9) $7a - 3b - 3c$	(19) 8	(29) 2	
(10) 8	(20) 4	(30) 1	

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] | (41) | a | 15 | [2] |
| | 16, 30 | [5] | | b | 85 | [2] |
| | | | | c | 80 | [2] |
| (39) | a | 13 | [3] | d | 80 | [4] |
| | b | 50 | [3] | (42) | Analysis | [5] |
| | c | 30 | [2] | | 2, 6 | [5] |
| | d | 20 | [2] | | | |
| (40) | b | $\frac{1}{2}$ | [2] | | | |
| | c | $\frac{2}{5}$ | [2] | | | |
| | d | 0 | [2] | | | |