

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

THREE-YEAR SEQUENCE FOR HIGH SCHOOL MATHEMATICS

COURSE I

Wednesday, August 16, 1995 – 8:30 to 11:30 a.m., only

Notice . . .

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

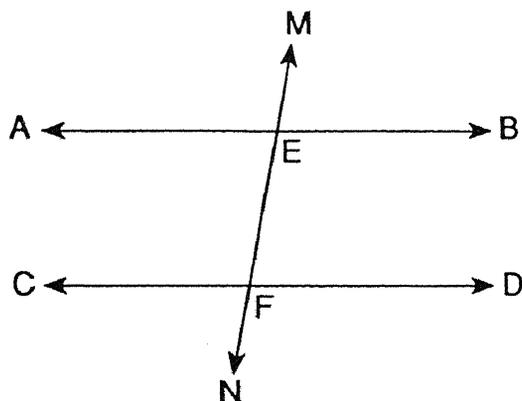
Part I

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 $x = 4$ and $y = -1$, find the value of $3x^2y$.

2 Solve for c : $0.7c - 4 = 3.7$

3 In the accompanying diagram, transversal \overleftrightarrow{MN} intersects parallel lines \overleftrightarrow{AB} and \overleftrightarrow{CD} at E and F , respectively. If $m\angle AEF$ is 80, find the number of degrees in $\angle EFD$.



4 Let p represent "The number is an odd number," and let q represent "The number is divisible by 2." Write in symbolic form: "If a number is not divisible by 2, then it is an odd number."

5 Find the sum:

$$(9m - 5n + 2) + (-4m - n - 1) + (-5m + 6n - 1)$$

6 Two rectangles are similar. The first rectangle has a length of 6 and a width of 2, and the second rectangle has a length of 12. Find the area of the second rectangle.

7 Find the quotient: $\frac{15x^2 - 12x + 9}{3}$

8 If the probability that it will rain is 0.8, what is the probability that it will *not* rain?

9 Three numbers are represented by $2x$, $3x$, and $4x$. If the mean of these three numbers is 15, what is the value of x ?

10 Solve for x in terms of p and q : $3x + p = q$

11 Solve for x : $\frac{3}{5}x - 4 = 8$

12 Brenda bowled 5 games. Her scores were 135, 150, 130, 180, and 130. What was the mode of her scores?

13 If y varies directly as x , and $y = 16$ when $x = 3$, find the value of y when $x = 9$.

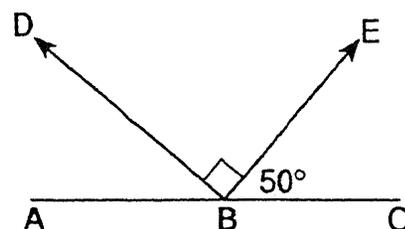
14 The ratio of two numbers is 8:5 and their sum is 52. Find the *smaller* number.

15 Write, in symbolic form, the inverse of $m \rightarrow \sim r$.

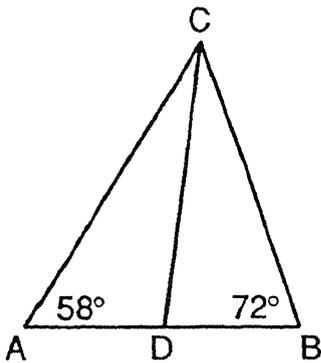
16 Solve the following system of equations for x :

$$\begin{aligned} 6x + y &= 18 \\ 2x - y &= 2 \end{aligned}$$

17 In the accompanying diagram, \overleftrightarrow{ABC} is a straight line, $\overrightarrow{BD} \perp \overrightarrow{BE}$, and $m\angle CBE = 50$. Find $m\angle ABD$.



- 18 In the accompanying diagram, \overline{CD} is the bisector of $\angle ACB$, $m\angle A = 58$, and $m\angle B = 72$. Find $m\angle ACD$.

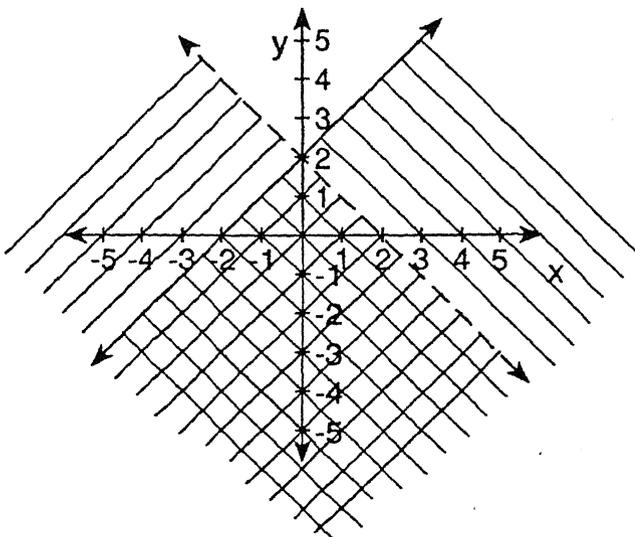


Directions (19–35): For each question chosen, write on the separate answer sheet the numeral preceding the word or expression that best completes the statement or answers the question.

- 19 The footlights of a stage have 12 red bulbs, 8 blue bulbs, and 10 yellow bulbs. If all the bulbs are expected to last the same amount of time, what is the probability that a yellow bulb will burn out first?

- (1) 1
 (2) $\frac{1}{30}$
 (3) $\frac{10}{30}$
 (4) $\frac{20}{30}$

- 20 Which ordered pair is in the solution set of the system of inequalities shown in the graph below?



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

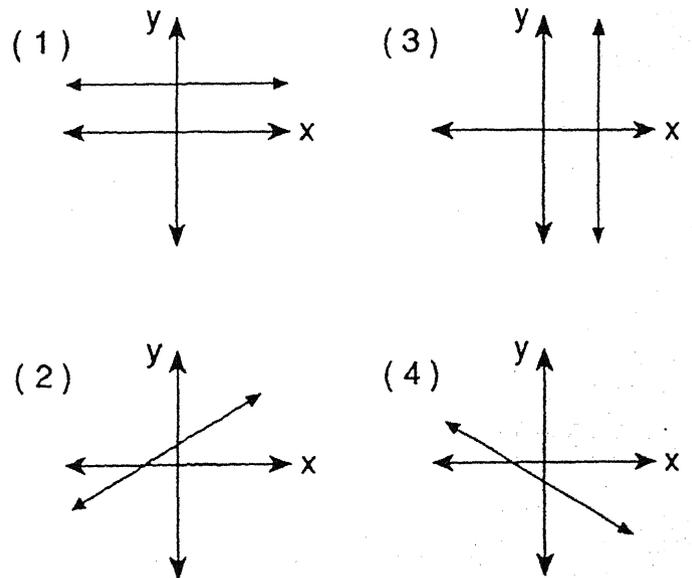
- 21 If $-24a^8b^3$ is divided by $6a^4b$, the quotient is

- (1) $-4a^2b^2$
 (2) $-4a^2b^3$
 (3) $-4a^4b$
 (4) $-4a^4b^2$

- 22 The diameter of a red blood cell is approximately 0.00074 centimeter. Expressed in scientific notation, this number is

- (1) 7.4×10^{-4} cm
 (2) 7.4×10^4 cm
 (3) 74×10^{-3} cm
 (4) 74×10^3 cm

- 23 Which graph represents a line that has a negative slope?



- 24 Two complementary angles are in the ratio 8:1. The number of degrees in the larger angle is

- (1) 10
 (2) 20
 (3) 80
 (4) 160

- 25 The sum of $\sqrt{12}$ and $5\sqrt{3}$ is

- (1) $7\sqrt{3}$
 (2) $10\sqrt{3}$
 (3) $6\sqrt{15}$
 (4) $15\sqrt{3}$

- 26 The expression $\frac{6}{3x-9}$ is undefined when x is equal to

- (1) 0
 (2) -3
 (3) 3
 (4) 9

27 If 5 is added to both the length and the width of a rectangle, then the perimeter is increased by

- (1) 5 (3) 20
(2) 10 (4) 25

28 The expression $3x^2 - 7x + 2$ is equivalent to

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

29 The least common denominator for the fractions

$\frac{13}{12x}$ and $\frac{7}{9x}$ is

- (1) $3x$ (3) $108x$
(2) $36x$ (4) $108x^2$

30 If p represents "x is an even number" and q represents "x is a multiple of 5," which statement is true when $x = 15$?

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

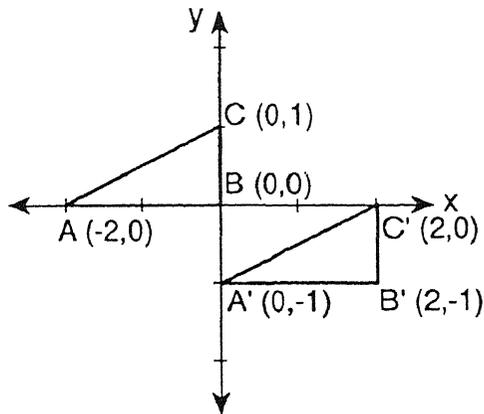
31 Which figure always has exactly one line of symmetry?

- (1) isosceles right triangle
(2) rectangle
(3) trapezoid
(4) circle

32 The area of a circle is 36π . What is the length of the diameter of the circle?

- (1) 6 (3) 12
(2) $6\sqrt{2}$ (4) 36

33 In the accompanying diagram, $\triangle A'B'C'$ is the image of $\triangle ABC$.



Which type of transformation is represented by $\triangle A'B'C'$?

- (1) rotation (3) reflection
(2) translation (4) dilation

34 What is the solution set of the equation $2x^2 + x - 3 = 0$?

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

35 If the ratio of the sides of two cubes is 3:4, what is the ratio of the volumes of the two cubes?

- (1) 3:4 (3) 9:16
(2) 9:12 (4) 27:64

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]

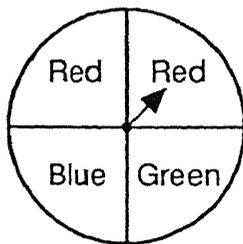
36 a On the same set of coordinate axes, graph the following equations:

$$\begin{aligned} y &= 1 \\ y &= x + 5 \quad [7] \\ x + y &= 5 \end{aligned}$$

b Find the area of the triangle formed by the lines graphed in part a. [3]

37 For a special order, the ABC Company manufactured 400 shirts. Sweatshirts were priced at \$35 each and T-shirts at \$25 each. The company received a total of \$11,500 for the shirts. How many of each type of shirt did the ABC Company manufacture for this order? [Show or explain the procedure used to obtain your answer.] [10]

38 In the accompanying diagram, the circle is divided into four equal areas. The spinner is spun twice and the color of the area that the spinner stops in is noted.



a Draw a tree diagram or list the sample space showing all possible outcomes. [4]

b Find the probability that

- (1) both spins will stop in a red area [2]
- (2) the first spin will stop in a red area and the second spin will stop in a black area [1]
- (3) at least one of the two spins will stop in a green area [3]

39 Forest Lake High School had a basketball competition for the ninth grade. The frequency table below shows the results for the number of baskets made by the 32 participating students.

Interval	Frequency
0-15	3
16-30	8
31-45	9
46-60	8
61-75	4

a Which interval contains the median? [2]

b On your answer paper, copy and complete the cumulative frequency table below using the data given in the frequency table. [2]

Interval	Cumulative Frequency
0-15	3
0-30	
0-45	
0-60	
0-75	

c Construct a cumulative frequency histogram using the table completed in part b. [4]

d What percent of the participating students made 46 or more baskets? [2]

40 Find three consecutive even integers such that when the first integer is multiplied by the third integer, the result is 2 more than 5 times the second integer. [Only an algebraic solution will be accepted.] [4,6]

41 Construct and complete the truth table for the statement $\sim(p \rightarrow \sim q) \leftrightarrow (p \wedge q)$. [10]

42 The length of a rectangle is 3 less than twice the width, and the perimeter of the rectangle is 96.

a Find the length and width of the rectangle. [6]

b Find, to the nearest integer, the length of the diagonal of the rectangle. [4]

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REGENTS HIGH SCHOOL EXAMINATION

SEQUENTIAL MATH – COURSE I

Wednesday, August 16, 1995 – 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.

FOR TEACHERS ONLY

SCORING KEY

THREE-YEAR SEQUENCE FOR HIGH SCHOOL MATHEMATICS

COURSE I

Wednesday, August 16, 1995 – 8:30 to 11:30 a.m., only

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 19–35, allow credit if the student has written the correct answer instead of the numeral 1, 2, 3, or 4.

(1) -48	(11) 20	(21) 4	(31) 1
(2) 11	(12) 130	(22) 1	(32) 3
(3) 80	(13) 48	(23) 4	(33) 2
(4) $\sim q \rightarrow p$	(14) 20	(24) 3	(34) 2
(5) 0	(15) $\sim m \rightarrow r$	(25) 1	(35) 4
(6) 48	(16) 2.5	(26) 3	
(7) $5x^2 - 4x + 3$	(17) 40	(27) 3	
(8) 0.2	(18) 25	(28) 4	
(9) 5	(19) 3	(29) 2	
(10) $\frac{q - p}{3}$	(20) 2	(30) 1	

Part II

Please refer to the Department's publication *Guide for Rating Regents Examinations in Mathematics* and its supplement. 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) <i>b</i> 16	[3]	(39) <i>a</i> 31-45	[2]
		<i>d</i> 37.5	[2]
(37) Sweatshirts	150	(40) Analysis	[4]
T-shirts	250	4,6,8	[6]
	[10]	(42) <i>a</i> 17,31	[6]
(38) <i>b</i> (1) $\frac{4}{16}$	[2]	<i>b</i> 35	[4]
(2) 0	[1]		
(3) $\frac{7}{16}$	[3]		