

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

THREE-YEAR SEQUENCE FOR HIGH SCHOOL MATHEMATICS

COURSE I

Friday, June 16, 1995 – 9:15 a.m. to 12:15 p.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.

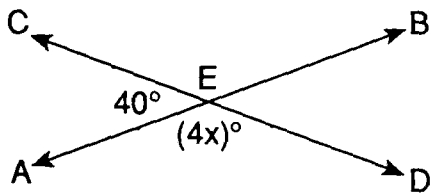
DO NOT OPEN THIS EXAMINATION BOOKLET UNTIL THE SIGNAL IS GIVEN

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]

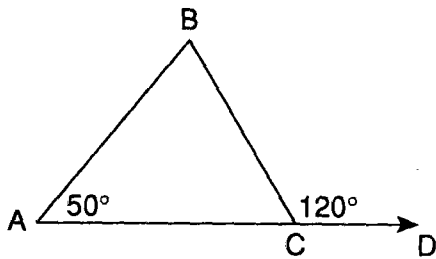
1 Let p represent "Mr. Ladd teaches mathematics" and let q represent "Mr. Ladd is the football coach." Write in symbolic form: "Mr. Ladd teaches mathematics and Mr. Ladd is not the football coach."

2 In the accompanying diagram, \overleftrightarrow{AB} intersects \overleftrightarrow{CD} at E . If $m\angle AEC = 40$ and $m\angle DEA = 4x$, what is the value of x ?

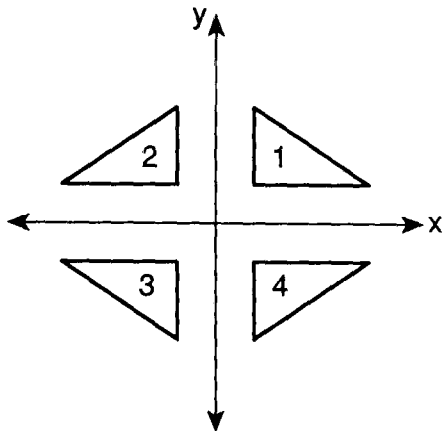


3 Solve for x : $8x - 7 = 5(x - 2)$

4 In the accompanying diagram of $\triangle ABC$, the measure of exterior angle BCD is 120° and $m\angle BAC = 50$. Find $m\angle ABC$.



5 In the accompanying diagram, which triangle is the image of $\triangle 2$ after a reflection in the x -axis?

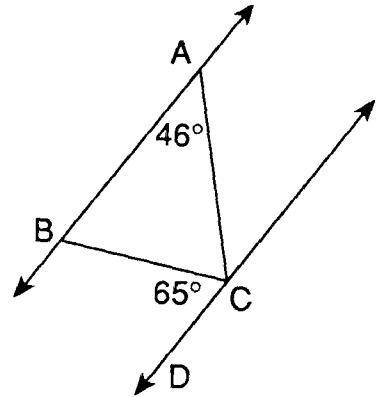


6 If $x = -2$ and $y = 4$, find the numerical value of the expression $7y - 3x$.

7 Solve for x : $\frac{2}{3}x - 6 = 14$

8 From $y^2 + 5y - 7$, subtract $y^2 - 3y - 4$.

9 In the accompanying diagram, \overleftrightarrow{AB} is parallel to \overleftrightarrow{CD} , $m\angle BAC = 46$, and $m\angle BCD = 65$. Find the measure of $\angle ACB$.



10 Solve for x : $\frac{6}{x+2} = \frac{2}{x}$, $x \neq 0, -2$

11 What is the slope of the line whose equation is $y = \frac{3}{4}x + 4$?

12 Express $\frac{4x}{2} - \frac{5x}{4}$ as a single fraction in simplest form.

13 For which value of x is the expression $\frac{2}{x+3}$ undefined?

14 Solve for x : $2x - y = 3$
 $x + y = 3$

15 A circle has a radius of 5. Express, in terms of π , the circumference of the circle.

16 In symbolic form, write the contrapositive of $p \rightarrow \sim q$.

17 A basketball team consists of 15 girls. The accompanying table shows the number of points each player scored in one season. Which interval contains the median for these data?

Interval	Frequency
101-120	1
81-100	4
61-80	2
41-60	3
21-40	3
0-20	2

18 The lengths of the sides of a triangle are 6, 8, and 12. If the length of the shortest side of a similar triangle is 10, what is the length of its longest side?

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.

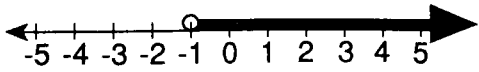
19 What is the product of $4xy^3$ and $3xy^2$?

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

20 During a half hour of television programming, eight minutes is used for commercials. If a television set is turned on at a random time during the half hour, what is the probability that a commercial is *not* being shown?

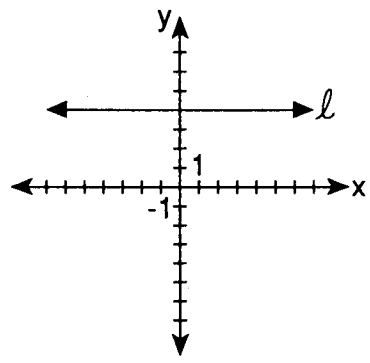
(1) 1 (3) $\frac{8}{30}$
 (2) $\frac{22}{30}$ (4) 0

21 Which inequality is represented by the graph below?



- (1) $x > -1$ (3) $x \geq -1$
 (2) $x < -1$ (4) $x \leq -1$

22 Which equation is represented by this graph of line l ?

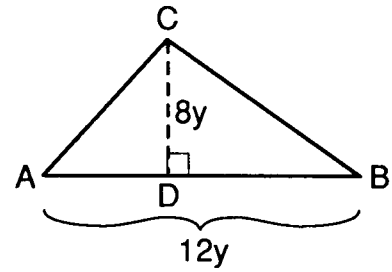


- (1) $x = y + 4$ (3) $x = 4$
 (2) $y = x + 4$ (4) $y = 4$

23 The expression $\sqrt{75}$ is equal to

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

24 In the accompanying diagram of $\triangle ABC$, $\overline{CD} \perp \overline{AB}$, $AB = 12y$, and $CD = 8y$.



The area of $\triangle ABC$ can be expressed as

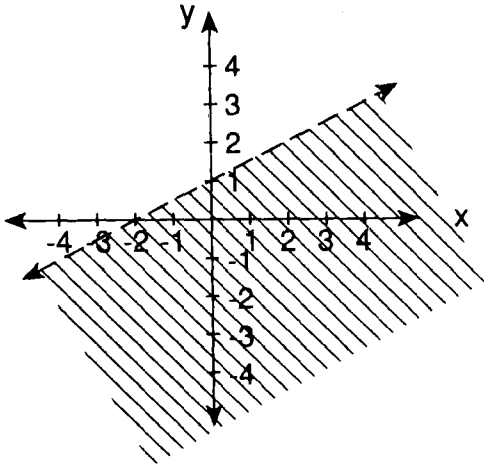
- (1) $96y^2$ (3) $24y^2$
 (2) $48y^2$ (4) $20y^2$

25 In the truth table below, which statement should be the heading for column 3?

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

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

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



- (1) $y > \frac{1}{2}x + 1$ (3) $y < \frac{1}{2}x + 1$
 (2) $y \geq \frac{1}{2}x + 1$ (4) $y \leq \frac{1}{2}x + 1$

27 If $2n$ represents an even integer, the next consecutive even integer is represented by

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

28 Which is a rational number?

- (1) $\sqrt{13}$ (3) $\sqrt{3}$
 (2) π (4) $\sqrt{0.16}$

29 The ages of the members of a family are 46, 48, 21, 12, 15, and 8. What is the mean age?

- (1) $16\frac{1}{2}$ (3) 25
 (2) 18 (4) 36

30 What is the supplement of an angle that measures $3x^\circ$?

- (1) $90^\circ - 3x^\circ$ (3) $180^\circ - 3x^\circ$
 (2) $3x^\circ - 90^\circ$ (4) $3x^\circ - 180^\circ$

31 The product of $2x - 3$ and $x + 4$ can be expressed as

- (1) $2x^2 + 5x - 12$ (3) $2x^2 + x - 12$
 (2) $3x + 1$ (4) $2x^2 - 12$

32 When the expressions $x^2 - 9$ and $x^2 - 5x + 6$ are factored, a common factor is

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

33 How many different ways can six different plants be arranged side by side on a shelf?

- (1) 6 (3) 720
 (2) 36 (4) 5,040

34 A wire reaches from the top of a 13-meter telephone pole to a point on the ground 9 meters from the base of the pole. What is the length of the wire to the nearest tenth of a meter?

- (1) 15.6 (3) 16.0
 (2) 15.8 (4) 16.2

35 If the angles of a triangle are represented by x , $3x + 20$, and $6x$, the triangle must be

- (1) obtuse (3) acute
 (2) right (4) isosceles

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]

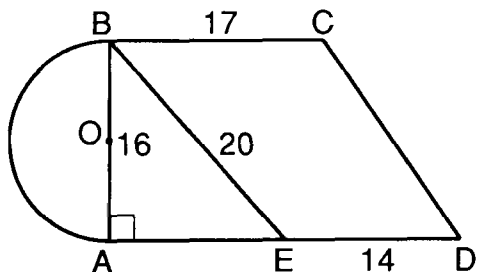
- 36 Solve the following system of equations graphically and check:

$$\begin{aligned} 3y &= -2x + 12 \\ y - x &= 4 \end{aligned} \quad [8,2]$$

- 37 Without looking, Liz chooses one chip from a box containing four chips numbered 1 through 4. Next she chooses one chip from a second box containing four chips lettered a , b , c , and d .

- a* Draw a tree diagram or list the sample space of all possible outcomes. [3]
b Find the probability that Liz chose
 (1) an odd number [1]
 (2) an even number and the letter c [2]
 (3) a number less than 4 or the letter a [2]
 (4) a number greater than 3 and a letter from the word "cobra" [2]

- 38 In the accompanying diagram, $ABCD$ is a trapezoid with bases \overline{AD} and \overline{BC} , \overline{AB} is perpendicular to \overline{AD} and is the diameter of semicircle O , $AB = 16$, $BC = 17$, $ED = 14$, and $BE = 20$.



- a* Find the length of \overline{AE} . [3]
b Find, to the nearest tenth, the area of the entire figure. [Use $\pi = 3.14$.] [7]

- 39 For a class project, 20 students recorded the number of hours of television that they each watched in one week: 5, 12, 29, 23, 35, 8, 41, 40, 13, 16, 31, 29, 18, 28, 15, 32, 38, 26, 20, 22.

- a* On your answer sheet, copy and complete the tables below to find the frequency and cumulative frequency in each interval. [4]

Interval	Tally	Frequency
0-9		
10-19		
20-29		
30-39		
40-49		

Interval	Cumulative Frequency
0-9	
0-19	
0-29	
0-39	
0-49	

- b* Using the cumulative frequency table completed in part *a*, construct a cumulative frequency histogram. [4]
c In one week, what percent of the 20 students watched television more than 9 hours but less than 20 hours? [2]

- 40 Solve the following system of equations algebraically and check:

$$\begin{aligned} 3x - 5y &= -6 \\ 2x - 3y &= -5 \end{aligned} \quad [8,2]$$

- 41 Find two consecutive *negative* integers such that the product is 42. [*Only an algebraic solution will be accepted.*] [4,6]

- 42 A landscaper has two gardens: one is a square and the other is a rectangle. The width of the rectangular garden is 5 yards less than a side of the square one, and the length of the rectangular garden is 3 yards more than a side of the square garden. If the sum of the areas of both gardens is 165 square yards, find the measure of a side of the square garden. [*Show or explain the procedure used to obtain your answer.*] [10]
-

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

SEQUENTIAL MATH – COURSE I

Friday, June 16, 1995 – 9:15 a.m. to 12:15 p.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

Friday, June 16, 1995 — 9:15 a.m. to 12:15 p.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) $p \wedge \sim q$	(11) $\frac{3}{4}$	(21) 1	(31) 1
(2) 35	(12) $\frac{3x}{4}$	(22) 4	(32) 2
(3) -1	(13) -3	(23) 4	(33) 3
(4) 70	(14) 2	(24) 2	(34) 2
(5) 3	(15) 10π	(25) 1	(35) 1
(6) 34	(16) $q \rightarrow \sim p$	(26) 3	
(7) 30	(17) 41–60	(27) 4	
(8) $8y - 3$	(18) 20	(28) 4	
(9) 69	(19) 3	(29) 3	
(10) 1	(20) 2	(30) 3	

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.

(37) b (1) $\frac{8}{16}$ [1]

(2) $\frac{2}{16}$ [2]

(3) $\frac{13}{16}$ [2]

(4) $\frac{3}{16}$ [2]

(38) a 12 [3]

b 444.5 [7]

(39) c 25 [2]

(40) $x = -7$
 $y = -3$ [8,2]

(41) -7 and -6 [4,6]

(42) 10 [10]