The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

TENTH YEAR MATHEMATICS

Wednesday, August 15, 1979 — 8:30 to 11:30 a.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.

On page 5 you will find the "Tables of Natural Trigonometric Functions" which you may need to answer some questions in this examination. Fold this page along the perforations, and tear it off also slowly and carefully.

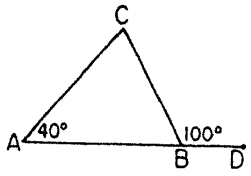
When you have completed the examination, you must sign the statement printed at the end of the answer paper, indicating that you had no unlawful knowledge of the questions or answers prior to the examination and that you have neither given nor received assistance in answering any of the questions during 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

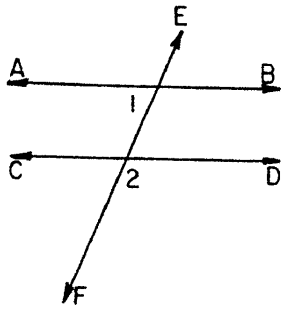
Answer all questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Unless otherwise specified, answers may be left in terms of π or in radical form. Write your answers in the spaces provided on the separate answer sheet.

1 As shown in the accompanying diagram, side $\overline{AB}$ of $\triangle ABC$ is extended to point D. If $m\angle A = 40$ and $m\angle CBD = 100$, find $m\angle C$.

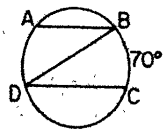


2 Line $\overleftrightarrow{PQ}$ is the perpendicular bisector of $\overline{AB}$. If $PA = 4n - 12$ and $PB = 2n + 10$, what is the value of n?

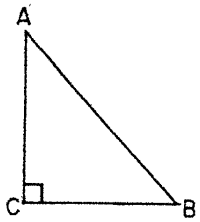
3 In the accompanying diagram, $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$, transversal $\overleftrightarrow{EF}$, and $m\angle 1 = 65$. Find $m\angle 2$.



4 In the accompanying diagram, chord $\overline{AB}$ is parallel to chord $\overline{DC}$ and $m\overset{\frown}{BC} = 70$. Find $m\angle B$.

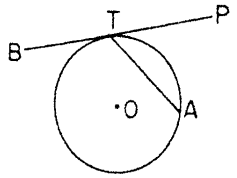


5 In the accompanying diagram, $\triangle ABC$ is a right triangle. If $m\angle C = 90$, $m\angle A = 45$, and $AC = 10$, find BC.



6 The lengths of the sides of a triangle are 5, 6, and 9. If the length of the *shortest* side of a similar triangle is 15, find the perimeter of the larger triangle.

7 In the accompanying diagram, $\overline{BTP}$ is tangent to circle O at point T. If the measure of minor arc $\overset{\frown}{AT}$ is 80°, find $m\angle PTA$.



8 The length of a diagonal of a square is $5\sqrt{2}$. What is the length of a side of the square?

9 In a circle, chords $\overline{AB}$ and $\overline{CD}$ intersect at point E. If $AE = EB = CE = a$, find ED in terms of a.

10 How many degrees are in the measure of each exterior angle of a regular polygon with 10 sides?

11 In $\triangle ABC$, D and E are points on sides $\overline{AC}$ and $\overline{BC}$, respectively, such that $\overline{DE} \parallel \overline{AB}$. If $AC = 6$, $AD = 2$, and $BE = 3$, find the length of $\overline{BC}$.

12 Find the slope of the line connecting points $A(2,1)$ and $B(4,6)$.

13 The lengths of the diagonals of a rhombus are 6 and 10. What is the area of the rhombus?

14 Quadrilateral $ABCD$ is inscribed in a circle. If the measure of angle A is 40 degrees more than the measure of angle C, what is $m\angle C$?

15 Two rectangles have congruent bases. The ratio of the lengths of their altitudes is 2:3. What is the ratio of the area of the smaller rectangle to the area of the larger rectangle?

16 If the coordinates of the endpoints of $\overline{MN}$ are $M(-3,-4)$ and $N(3,8)$, find the coordinates of the midpoint of $\overline{MN}$.

17 In t
hyp
and

Direct
separate
sion that
question

18 The
is 2
of t
(1)
(2)

19 Wh
slee
(1)
(2)
(3)
(4)

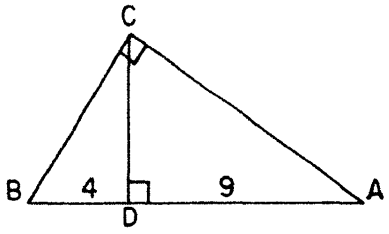
20 The
the
me
lon
(1)
(2)

21 The
AB
The
(1)
(2)

22 Wh
poi
(1)
(2)

23 The
The
(1)
(2)

17 In the accompanying diagram, $\overline{CD}$ is the altitude to hypotenuse $\overline{AB}$ of right triangle ABC. If $BD = 4$ and $AD = 9$, find CD.



Directions (18–29): Write in the space provided on the separate answer sheet the *numeral* preceding the expression that best completes *each* statement or answers *each* question.

18 The ratio of the measures of the angles of a triangle is 2:4:9. The number of degrees in the *smallest* angle of the triangle is

(1) 24 (3) 48
(2) 36 (4) 108

19 Which is the converse of the statement, "If I am sleeping, then I am breathing"?

(1) If I am sleeping, then I am not breathing.
(2) If I am not sleeping, then I am breathing.
(3) If I am not breathing, then I am not sleeping.
(4) If I am breathing, then I am sleeping.

20 The length of one base of a trapezoid is three times the length of the other base. If the length of the median of the trapezoid is 10, the length of the *longer* base is

(1) 7.5 (3) 15
(2) 12 (4) 20

21 The coordinates of the vertices of parallelogram $ABCD$ are $A(-5,7)$, $B(6,-3)$, $C(10,2)$, and $D(x,y)$. The numerical coordinates of point D are

(1) $(-1,12)$ (3) $(11,6)$
(2) $(6,13)$ (4) $(11,12)$

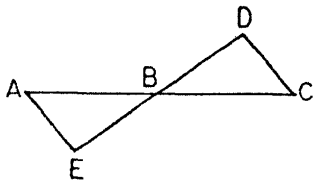
22 What is the length of a line segment whose endpoints are $(2,7)$ and $(-3,1)$?

(1) $\sqrt{7}$ (3) $\sqrt{37}$
(2) $\sqrt{11}$ (4) $\sqrt{61}$

23 The diagonals of a rhombus have lengths 10 and 24. The length of a side of the rhombus is

(1) 15 (3) 12
(2) 13 (4) 10

24 In the accompanying diagram, $\overline{DBE}$ bisects $\overline{ABC}$ and $\angle A \cong \angle C$. Which statement could be used to prove $\triangle ABE \cong \triangle CBD$?



(1) Two triangles are congruent if the three sides of one triangle are congruent respectively to the three sides of the other.
(2) Two triangles are congruent if two sides and the included angle of one triangle are congruent respectively to two sides and the included angle of the other.
(3) Two triangles are congruent if two angles and the included side of one triangle are congruent respectively to two angles and the included side of the other.
(4) Two triangles are congruent if the three angles of one triangle are congruent respectively to the three angles of the other.

25 The length of each side of regular hexagon $ABCDEF$ is 10. What is the length of the radius of the circle circumscribed about the hexagon?

(1) 5 (3) 10
(2) $5\sqrt{3}$ (4) $10\sqrt{3}$

26 The area of a sector of a circle is 6π and the measure of its central angle is 120°. The area of the circle is

(1) 9π (3) 12π
(2) 2π (4) 18π

27 Triangle ABC is isosceles with $\overline{AB} \cong \overline{BC}$. If the measure of $\angle ABC$ is greater than 60°, which statement must be true?

(1) An exterior angle at vertex C is greater than an exterior angle at vertex B.
(2) An exterior angle at vertex B is greater than an exterior angle at vertex A.
(3) $\overline{AC}$ is the shortest side of the triangle.
(4) $\overline{BC}$ is the longest side of the triangle.

28 The number of points that are 3 units from line ℓ and also 2 units from a point P on line ℓ is

(1) 1 (3) 0
(2) 2 (4) 4

29 In quadrilateral $ABCD$, if $m\angle A = 40$ and $m\angle B = 140$, quadrilateral $ABCD$ must
(1) be a rhombus
(2) have at least one pair of sides parallel
(3) be an isosceles trapezoid
(4) have at least one right angle

Directions (30): Leave all construction lines on the answer sheet.

30 Given line segments a and b. *On the answer sheet,* on the ray provided, construct a line segment equal in length to $a + \frac{1}{2}b$.

Tear Here

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.

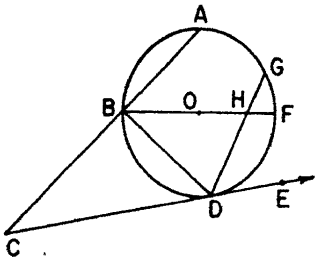
31 Prove *either* a or b but *not* both.

a If two angles of a triangle are congruent, the sides opposite these angles are congruent. [10]

OR

b The measure of an angle formed by two secants is equal to one-half the difference of the measures of the intercepted arcs. [10]

32 Given: Circle O with diameter $\overline{BOHF}$, secant $\overline{CBA}$, chord $\overline{DHG}$, $\overrightarrow{CE}$ tangent to circle O at D, $m\overset{\frown}{DF} = 80$, and $m\overset{\frown}{BA}:m\overset{\frown}{AG}:m\overset{\frown}{GF} = 3:2:1$.



Find:

a $m\overset{\frown}{GF}$ [2]

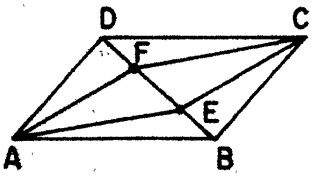
b $m\angle BHD$ [2]

c $m\angle BDG$ [2]

d $m\angle GDE$ [2]

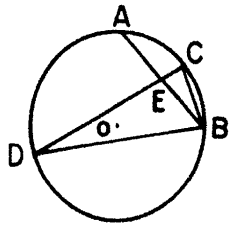
e $m\angle C$ [2]

33 Given: Parallelogram $ABCD$, $\overline{DFEB}$, $\overline{DF} \cong \overline{BE}$



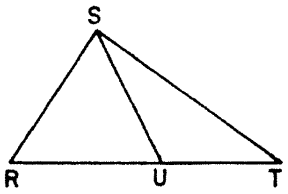
Prove: $AECF$ is a parallelogram. [10]

34 Given: Circle O, C is the midpoint of $\overset{\frown}{AB}$; chords $\overline{AB}$, $\overline{BC}$, $\overline{CD}$, and $\overline{DB}$ are drawn.



Prove: $CD \times CE = (CB)^2$ [10]

35 Given: $\triangle RST$, $\overline{RUT}$, and $\overline{RS} \cong \overline{RU}$



Prove: $m\angle SUT > m\angle RUS$ [10]

36 The length of each side of a regular five-sided polygon is 8.

a Find to the *nearest tenth* the length of the apothem of the polygon. [7]

b Using the result obtained in the answer to part *a*, find the area of the polygon. [3]

37 The coordinates of the vertices of triangle ABC are $A(4,4)$, $B(10,2)$, and $C(8,6)$.

a Show by means of coordinate geometry that $\triangle ABC$ is isosceles. [3]

b Show by means of coordinate geometry that $\triangle ABC$ is a right triangle and state a reason for your conclusion. [4]

c Find the area of $\triangle ABC$. [3]

Tear Here

THE UNIVERSITY OF THE STATE OF NEW YORK

THE STATE EDUCATION DEPARTMENT

DIVISION OF EDUCATIONAL TESTING

Tables of Natural Trigonometric Functions

(For use with 9th and 10th Year Mathematics Regents Examinations)

Angle	Sine	Cosine	Tangent	Angle	Sine	Cosine	Tangent
1°	.0175	.9998	.0175	46°	.7193	.6947	1.0355
2°	.0349	.9994	.0349	47°	.7314	.6820	1.0724
3°	.0523	.9986	.0524	48°	.7431	.6691	1.1106
4°	.0698	.9976	.0699	49°	.7547	.6561	1.1504
5°	.0872	.9962	.0875	50°	.7660	.6428	1.1918
6°	.1045	.9945	.1051	51°	.7771	.6293	1.2349
7°	.1219	.9925	.1228	52°	.7880	.6157	1.2799
8°	.1392	.9903	.1405	53°	.7986	.6018	1.3270
9°	.1564	.9877	.1584	54°	.8090	.5878	1.3764
10°	.1736	.9848	.1763	55°	.8192	.5736	1.4281
11°	.1908	.9816	.1944	56°	.8290	.5592	1.4826
12°	.2079	.9781	.2126	57°	.8387	.5446	1.5399
13°	.2250	.9744	.2309	58°	.8480	.5299	1.6003
14°	.2419	.9703	.2493	59°	.8572	.5150	1.6643
15°	.2588	.9659	.2679	60°	.8660	.5000	1.7321
16°	.2756	.9613	.2867	61°	.8746	.4848	1.8040
17°	.2924	.9563	.3057	62°	.8829	.4695	1.8807
18°	.3090	.9511	.3249	63°	.8910	.4540	1.9626
19°	.3256	.9455	.3443	64°	.8988	.4384	2.0503
20°	.3420	.9397	.3640	65°	.9063	.4226	2.1445
21°	.3584	.9336	.3839	66°	.9135	.4067	2.2460
22°	.3746	.9272	.4040	67°	.9205	.3907	2.3559
23°	.3907	.9205	.4245	68°	.9272	.3746	2.4751
24°	.4067	.9135	.4452	69°	.9336	.3584	2.6051
25°	.4226	.9063	.4663	70°	.9397	.3420	2.7475
26°	.4384	.8988	.4877	71°	.9455	.3256	2.9042
27°	.4540	.8910	.5095	72°	.9511	.3090	3.0777
28°	.4695	.8829	.5317	73°	.9563	.2924	3.2709
29°	.4848	.8746	.5543	74°	.9613	.2756	3.4874
30°	.5000	.8660	.5774	75°	.9659	.2588	3.7321
31°	.5150	.8572	.6009	76°	.9703	.2419	4.0108
32°	.5299	.8480	.6249	77°	.9744	.2250	4.3315
33°	.5446	.8387	.6494	78°	.9781	.2079	4.7046
34°	.5592	.8290	.6745	79°	.9816	.1908	5.1446
35°	.5736	.8192	.7002	80°	.9848	.1736	5.6713
36°	.5878	.8090	.7265	81°	.9877	.1564	6.3138
37°	.6018	.7986	.7536	82°	.9903	.1392	7.1154
38°	.6157	.7880	.7813	83°	.9925	.1219	8.1443
39°	.6293	.7771	.8098	84°	.9945	.1045	9.5144
40°	.6428	.7660	.8391	85°	.9962	.0872	11.4301
41°	.6561	.7547	.8693	86°	.9976	.0698	14.3007
42°	.6691	.7431	.9004	87°	.9986	.0523	19.0811
43°	.6820	.7314	.9325	88°	.9994	.0349	28.6363
44°	.6947	.7193	.9657	89°	.9998	.0175	57.2900
45°	.7071	.7071	1.0000	90°	1.0000	.0000	

Tear Here

Tear Here

Tear Here

The University of the State of New York

REGENTS HIGH SCHOOL EXAMINATION

TENTH YEAR MATHEMATICS

Wednesday, August 15, 1979 — 8:30 to 11:30 a.m., only

Part I Score: .....
Rater's Initials:
.....

ANSWER SHEET

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

School.....

Name and author of textbook used .....

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

Part I

Answer all questions in this part.

1.....	11.....	21.....
2.....	12.....	22.....
3.....	13.....	23.....
4.....	14.....	24.....
5.....	15.....	25.....
6.....	16.....	26.....
7.....	17.....	27.....
8.....	18.....	28.....
9.....	19.....	29.....
10.....	20.....	30 **Answer question 30 on the other side of this sheet.**

Tear Here

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

10

SCORING KEY

TENTH YEAR MATHEMATICS

Wednesday, August 15, 1979 — 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 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 2 credits for each correct answer; allow no partial credit. For questions 18–29, allow credit if the pupil has written the correct answer instead of the numeral 1, 2, 3, or 4.

(1) 60

(2) 11

(3) 115

(4) 35

(5) 10

(6) 60

(7) 40

(8) 5

(9) a

(10) 36

(11) 9

(12) $\frac{5}{2}$

(13) 30

(14) 70

(15) $\frac{2}{3}$ *or* 2:3

(16) (0,2) *or* $\begin{matrix} x = 0 \\ y = 2 \end{matrix}$

(17) 6

(18) 1

(19) 4

(20) 3

(21) 1

(22) 4

(23) 2

(24) 3

(25) 3

(26) 4

(27) 1

(28) 3

(29) 2

[OVER]

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.

(32) *a* 30 [2]
b 65 [2]
c 75 [2]
d 55 [2]
e 35 [2]

(36) *a* 5.5 [7]
b 110 [3]

(37) *c* 10 [3]

New York State Education Department

Three-year Sequence for High School Mathematics

Course II

Final Examination

In Lieu of the Tenth Year Mathematics Regents Examination

Wednesday, August 15, 1979, a.m.

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.

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 radical form.

1 If the measures of two consecutive angles of a parallelogram are represented by $(x + 40)$ and $(2x - 10)$, find x.

2 In ΔABC, D is a point on $\overline{AB}$ and E is a point on $\overline{AC}$ such that $\overline{DE} \parallel \overline{BC}$. If $AD = 4$, $DB = 2$, and $AC = 9$, find AE.

3 What is the slope of a line parallel to the line whose equation is $y - 2x = 7$?

4 Find the side of a rhombus whose diagonals are 6 and 8.

5 If a committee consists of 3 men and 2 women, what is the probability of selecting a subcommittee of 3 women?

6 How many different 5-letter permutations are there from the word "SEEDS"?

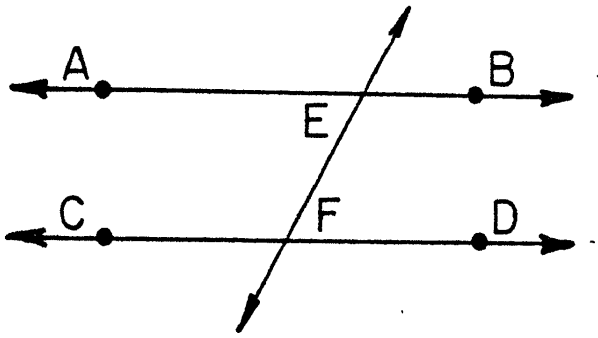
7 Given right triangle ABC with altitude $\overline{CD}$ drawn to hypotenuse $\overline{AB}$. If $AC = 6$ and $AD = 3$, find AB.

8 What is the midpoint of the segment whose endpoints are $(-3,8)$ and $(-7,-10)$?

9 If 3 is a root of $x^2 - 4x + k = 0$, find k.

10 In ΔABC, $\overline{AB} \cong \overline{AC}$. If the measure of $\angle A = 40$, find the measure of $\angle B$.

11 In the diagram, $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$. If the measure of $\angle AEF = x + 50$ and the measure of $\angle DFE = 3x + 30$, find x.



12 Write the equation of a line in the form $x^2 + bx + c = 0$ for which the solution set is $\{3,-5\}$.

13 Write the equation of a circle with center (2,-3) and radius 5.

14 What is the altitude of an equilateral triangle with a side of 4?

15 In ΔABC the measure of $\angle A$ is 40 and the measure of the exterior angle at vertex B is 120. Which is the longest side of the triangle?

16 What is the area of a trapezoid with bases 8 and 12, and an altitude of 5?

17 What is the length of a side of a square whose diagonal measures $3\sqrt{2}$?

18 If the letters of the word "PARALLEL" are rearranged at random, what is the probability that an "L" will be in the first position?

Base your answers to questions 19 through 21 on the systems below.

#	q	r	s	t
q	t	q	r	s
r	q	r	s	t
s	r	s	t	q
t	s	t	q	r

ϕ	q	r	s	t
q	s	t	q	r
r	t	q	r	s
s	q	r	s	t
t	r	s	t	q

19 What is the identity element under the operation ϕ?

20 What is the inverse of t under the operation #?

21 Solve: q # (r ϕ t)

Directions (22-34): 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 What is the negation of $\sim p \vee q$?

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

23 What is the value of x in the equation $2x^2 + 5x - 1 = 0$?

(1) $\frac{5 \pm \sqrt{17}}{4}$
(2) $\frac{-5 \pm \sqrt{17}}{4}$
(3) $\frac{5 \pm \sqrt{33}}{4}$
(4) $\frac{-5 \pm \sqrt{33}}{4}$

24 Which is logically equivalent to the statement, "If it is cold, then I will go skiing"?

(1) If it is not cold, then I will not go skiing.
(2) If I go skiing, then it is cold.
(3) If I do not go skiing, then it is not cold.
(4) If I go skiing, then it is not cold.

25 Which is logically concluded from the true statements, "If I drive a smaller car, I will use less gas," and "If I use less gas, the President will be happy"?

(1) If I drive a smaller car, the President will be happy.
(2) If I use less gas, I will drive a smaller car.
(3) If the President will be happy, I will drive a smaller car.
(4) If I do not drive a smaller car, I will not use less gas.

26 Which of the following may be the lengths of the sides of an isosceles triangle?

(1) 1,2,4
(2) 5,5,7
(3) 3,4,5
(4) 4,4,8

27 What is the negation of the statement, "All math is fun"?

(1) No math is fun.
(2) Some math is fun.
(3) Some math is not fun.
(4) All math is not fun.

28 If AB = 6, how many points are equidistant from the points A and B and also 4 units from A?

(1) 1
(2) 2
(3) 0
(4) 4

29 Which is an equation of a line that has a y-intercept of 5 and has a slope of -3?

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

30 Under which operation is the set of odd integers closed?

(1) addition
(2) subtraction
(3) multiplication
(4) division

31 If the vertex angles of two isosceles triangles are congruent, then the two triangles must be

(1) acute
(2) right
(3) congruent
(4) similar

32 If the areas of two similar triangles are in the ratio 4:9, the corresponding sides of the triangles are in the ratio

(1) 2:3
(2) 2:4.5
(3) 4:9
(4) 16:81

33 Which is the equation of the axis of symmetry for the graph of $y = x^2 + 10x - 6$?

(1) $x = 5$
(2) $x = -5$
(3) $x = 10$
(4) $x = -10$

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

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

Directions (35): Leave all construction lines on the answer sheet.

35 On the answer sheet, construct the altitude from vertex B to $\overline{AC}$.

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

Part II

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

36 Given the equation: $y = x^2 - 6x + 8$

a Draw the graph of the equation using all integral values from $x = 0$ to $x = 6$ inclusive. [4]

b Write the equation for the axis of symmetry. [2]

c Write the coordinates of the turning point. [2]

d What are the roots of the equation $x^2 - 6x + 8 = 0$? [2]

37 In rectangle ABCD, AB = x, BC = x + 7, and diagonal BD = x + 8. Find BD. [Only an algebraic solution will be accepted.] [10]

38 Al, Bob, Chris, Dave, Ed, and Frank are all members of a junior class committee. A 4-person subcommittee is to be selected from these boys at random.

a How many different 4-person subcommittees could be formed? [3]

b How many of these subcommittees will include Dave? [3]

c What is the probability that Dave will be selected? [2]

d What is the probability that Bob will not be selected? [2]

39 Given the points A(k,4), B(3,1), C(2k,6), and D(7,1).

a Express the slope of $\overleftrightarrow{AB}$ in terms of k. [2]

b Express the slope of $\overleftrightarrow{CD}$ in terms of k. [2]

c If $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$, write an equation that could be used to find k. [2]

d Using your answer from part c, find k. [2]

e Write an equation of $\overleftrightarrow{BD}$. [2]

40 Given the following system:

+	J	K	L	M
J	L	M	J	K
K	M	J	K	L
L	J	K	L	M
M	K	L	M	J

a What is the identity element? [2]

b What is the inverse of K? [2]

c What is the value of L + L + L? [2]

d Find y such that J + (M + K) = y. [2]

e Find x such that J + x = M. [2]

41 On your answer paper, write the letters a through e. Next to each letter write the numeral of the valid conclusion, chosen from the list below, which can be deduced from each statement.

[3]

Valid Conclusions

[3]

(1) q
(2) $\sim q$
(3) p
(4) $\sim p$
(5) $p \rightarrow r$
(6) $p \rightarrow \sim r$
(7) $r \rightarrow p$
(8) $\sim r \rightarrow p$

[2]

a $p \rightarrow \sim q$
p

[2] [2]

[2]

b $\sim p \vee q$
$\sim q$

[2] [2]

[2]

c $p \rightarrow q$
$r \rightarrow \sim q$

[2] [2]

[2]

d $\sim p \rightarrow q$
$\sim q$

[2]

e $r \rightarrow q$
$q \rightarrow p$

[2]

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

Part III

[2]

Answer one question from this part. Show all work unless otherwise directed.

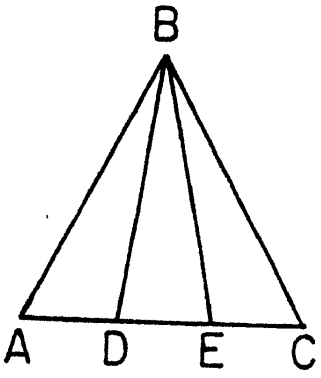
[2]

[2] 42 Given quadrilateral ABCD with coordinates A(3,4), B(0,0), C(4,-3), and D(7,1).

[2]

By means of coordinate geometry, determine whether or not ABCD is a rhombus and give an explanation for your answer. [10]

43 Given: ΔABC with $\overline{AB} \cong \overline{BC}$, points D and E on $\overline{AC}$ such that $\overline{AD} \cong \overline{EC}$.



Prove: $\angle BDE \cong \angle BED$ [10]

44 Given the following sentences:

Either Al went to college or he joined the army.
If he joined the army, then his hair was cut short.
If his hair was cut short, then it does not cover his ears.
Al's hair covers his ears.

Let C represent: "Al went to college."
Let A represent: "He joined the army."
Let H represent: "His hair was cut short."
Let E represent: "His hair covers his ears."

a Using C, A, H, E, and proper connectives, express each sentence in symbolic form. [4]

b Using laws of inference, show that Al went to college. [6]

EC.

Part I

Score_____

New York State Education Department

Three-year Sequence for High School Mathematics

Course II

Final Examination

Wednesday, August 15, 1979, a.m.

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

School.....

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

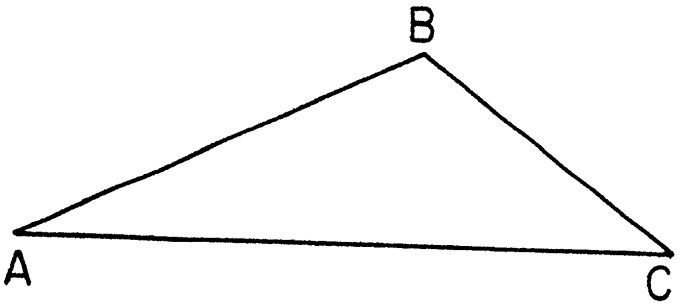
Part I

Answer only 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 Answer question 35 on the other side of this sheet.
12_____	24_____	

[OVER]

35



Your answers for Part II and Part III 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 II

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 22-34, allow credit if the pupil has written the correct answer instead of the numeral 1,2,3 or 4.

(1) 50

(2) 6

(3) 2

(4) 5

(5) 0

(6) 30

(7) 12

(8) $(-5,-1)$ or $\begin{matrix} x = -5 \\ y = -1 \end{matrix}$

(9) 3

(10) 70

(11) 10

(12) $x^2 + 2x - 15 = 0$

(13) $(x - 2)^2 + (y + 3)^2 = 25$

(14) $2\sqrt{3}$

(15) $\overline{AB}$ or c or AB

(16) 50

(17) 3

(18) $\frac{3}{8}$

(19) s

(20) t

(21) r

(22) 2

(23) 4

(24) 3

(25) 1

(26) 2

(27) 3

(28) 2

(29) 3

(30) 3

(31) 4

(32) 1

(33) 2

(34) 1

(35) construction

[OVER]

General Directions - Parts II and III

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.

Part II

(36) b $x = 3$ [2]

c $(3,-1)$ or $\begin{matrix} x = 3 \\ y = -1 \end{matrix}$ [2]

d $\begin{matrix} x = 4 \\ x = 2 \end{matrix}$ or $\{2,4\}$ [2]

(37) Analysis [5]
13 [5]

(38) a 15 [3]

b 10 [3]

c $\frac{10}{15}$ or $\frac{2}{3}$ [2]

d $\frac{5}{15}$ or $\frac{1}{3}$ [2]

(39) a $\frac{3}{k-3}$ [2]

b $\frac{5}{2k-7}$ [2]

c $\frac{3}{k-3} = \frac{5}{2k-7}$ [2]

d 6 [2]

e $y = 1$ or $\frac{y-1}{x-7} = \frac{0}{4}$ [2]

(40) a L [2]

b M [2]

c L [2]

d J [2]

e K [2]

(41) a 2 [2]

b 4 [2]

c 6 [2]

d 3 [2]

e 7 [2]

Part III

(44) a $C \vee A$
$A \rightarrow H$
$H \rightarrow \sim E$
E
[4]