The University of the State of New York

Centennial of Regents Examinations

1865–1965

10

REGENTS HIGH SCHOOL EXAMINATION

TENTH YEAR MATHEMATICS

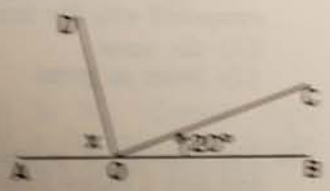
Friday, June 18, 1965 — 1:15 to 4:15 p.m., only

The last page of the booklet is the answer sheet, which is perforated. Fold the last page along the perforation and then, slowly and carefully, tear off the answer sheet. Now fill in the heading of your answer sheet. When you have finished the heading, you may begin the examination immediately.

Part I

Answer all questions in 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.

1 As shown in the diagram, AB is a straight line and angle $BOC = 20°$. If the number of degrees in angle DOC is 6 more than the number of degrees in angle x, find the number of degrees in angle x.



2 The end points of a diameter of circle O are $A\ (-2,4)$ and $B\ (2,0)$. Find the coordinates of the center of the circle.

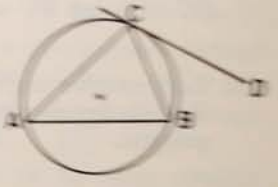
3 The area of a square is 9. The square and an equilateral triangle have equal perimeters. Find the length of a side of the triangle.

4 The bases of a trapezoid are 10 inches and 20 inches. If the area of the trapezoid is 60 square inches, find the number of inches in the length of the altitude of the trapezoid.

5 The side of a square is 6. Find in radical form the length of a diagonal of the square.

6 Two consecutive angles of a parallelogram are in the ratio 3:2. Find the number of degrees in the larger angle.

7 In the diagram, triangle ABC is inscribed in a circle and CD is tangent to the circle. If angle BCD is 40°, how many degrees are there in angle AC?



8 The diagonals of a rhombus are represented by x and $x + 3$. Express the area of the rhombus in terms of x.

9 The circumference of a circle is 8π. What is the area of the circle in terms of π?

10 A tangent PT and a secant PAC are drawn to a circle from the same external point P. The tangent is 6 inches long and the secant is 12 inches long. Find in inches the length of the external segment of the secant.

11 Two sides of a parallelogram are 6 and 10. The angle formed by these sides is 30°. Find the area of the parallelogram.

12 Find in radical form the length of the line segment joining the points whose coordinates are $(2,4)$ and $(0,-3)$.

13 An arc of a circle is 10 inches in length. If the arc contains 72°, find the number of inches in the circumference of the circle.

[over]

14 From the extremities of diameter AB of a circle, chords AC and BD are drawn, intersecting within the circle at point E. If arc DC contains 20°, how many degrees are there in angle AEB?

15 In triangle ABC, angle C is a right angle and CD is the altitude to hypotenuse AB. If AD is 5 and DB is 7, find in radical form the length of CD.

16 A chord 16 inches long is drawn 6 inches from the center of a circle. Find the number of inches in the length of the radius of the circle.

17 Write an equation of the locus of points whose ordinates are 2 less than their abscissas.

18 The diagonal of a rectangle makes an angle of 27° with the longer side of the rectangle. If the diagonal is 20, find to the *nearest integer* the length of the shorter side of the rectangle.

19 In triangle ABC, D is a point on AC and E is a point on BC so that DE is parallel to AB. If $AD = 4$, $DC = 6$ and $BC = 15$, find the length of BE.

20 Each exterior angle of a regular polygon contains 40°. Find in degrees the sum of the interior angles of this polygon.

21 Side AB of triangle ABC is extended through B to point D. If angle $CBD = 130°$ and angle $CAB = 55°$, which is the longest side of triangle ABC?

22 Corresponding sides of two similar polygons are 6 and 8. If the perimeter of the smaller is 27, find the perimeter of the larger.

Directions (23–28): Write in the space provided on the separate answer sheet the *number* preceding the expression that best completes *each* statement or answers *each* question.

23 For every quadrilateral inscribed in a circle, it is true that
(1) its opposite angles are supplementary
(2) its opposite angles are equal
(3) its diagonals bisect each other
(4) it is a rhombus

24 From an external point A, tangents AB and AC are drawn, meeting circle O at B and C. Radii OB and OC are drawn. If the number of degrees in angle A is represented by m, the number of degrees in angle BOC is represented by
(1) m (2) $360 - m$ (3) $180 - m$ (4) $90 - m$

25 The equation of the locus of points equidistant from the points whose coordinates are $(-3,4)$ and $(7,4)$ is
(1) $y = 0$ (3) $x = 5$
(2) $x = 2$ (4) $y = 4$

26 Given the statement, "If a student has room 111 as a homeroom, he is a senior." Which of the following is a valid conclusion from this statement?
(1) If a student is a senior, he has room 111 as a homeroom.
(2) If a student does not have room 111 as a homeroom, he is not a senior.
(3) If a student is not a senior, he does not have room 111 as a homeroom.
(4) If a student has room 112 as a homeroom, he is not a senior.

27 The length and the width of rectangle $PQRS$ are double those of rectangle $ABCD$. The area of $PQRS$, compared with the area of $ABCD$, is
(1) the same (3) four times as great
(2) twice as great (4) eight times as great

28 The number of points that are 2 inches from a line and also 3 inches from a point on the line is
(1) 1 (2) 2 (3) 0 (4) 4

Directions (29–30): Leave all construction lines on the answer sheet.

29 *On the answer sheet*, construct the altitude of obtuse $\triangle ABC$ from point B to side AC.

30 *On the answer sheet*, find by construction the center of the circle that can be inscribed in triangle ABC.

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

Part II

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

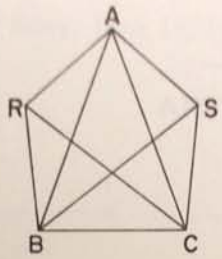
31 Prove *either* *a* or *b* but *not* both: [10]

a The sum of the angles of a triangle is equal to a straight angle.

OR

b The area of a parallelogram is equal to the product of one side and the altitude drawn to that side.

32 In the accompanying figure, $AB = AC$, $\angle RAB = \angle SAC$ and $\angle RBA = \angle SCA$.



Prove:

a $AR = AS$ [3]

b $\angle ACR = \angle ABS$ [7]

33 In acute $\triangle ABC$, BD is an altitude on side AC and AE is an altitude on side BC.

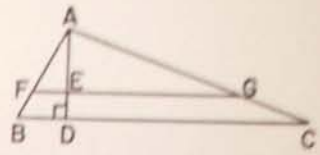
Prove: $AE \times BC = BD \times AC$ [10]

34 The radius of circle O is 10. Central angle $AOB = 40°$. Chord AB is drawn. Find, to the *nearest integer*, the area of *each* of the following:

a triangle AOB [7]

b minor sector AOB [Use the approximation $\pi = 3.14$.] [3]

35 In the accompanying figure, FG is parallel to BC. The altitude AD of triangle ABC is 6 and BC is 24. The ratio of the area of triangle AFG to the area of triangle ABC is 4 : 9.



a Find the length of FG. [6]

b Find the length of the altitude of trapezoid $BCGF$. [4]

36 The vertices of a quadrilateral are A (—4,—1), B (2,3), C (5,1) and D (4,—2).

a Using graph paper, draw quadrilateral $ABCD$. [2]

b Find the area of quadrilateral $ABCD$. [8]

*37 Given points A (3,1), B (0,—1) and C (—3,—3).

a Write an equation of the line which passes through point A and is parallel to the y-axis. [2]

b Write an equation of the line which passes through point B and has the slope 1. [2]

c Show that A, B and C lie on the same straight line. [4]

d Write an equation of the line which is parallel to AB and passes through the origin. [2]

*This question is based on an optional topic in the syllabus.

Part I Score: .....

Rater's Initials: .....

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TENTH YEAR MATHEMATICS

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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.....	9.....	17.....
2.....	10.....	18.....
3.....	11.....	19.....
4.....	12.....	20.....
5.....	13.....	21.....
6.....	14.....	22.....
7.....	15.....	23.....
8.....	16.....	24.....

Questions 25 through 30 should be answered on the back of this page.

[OVER]

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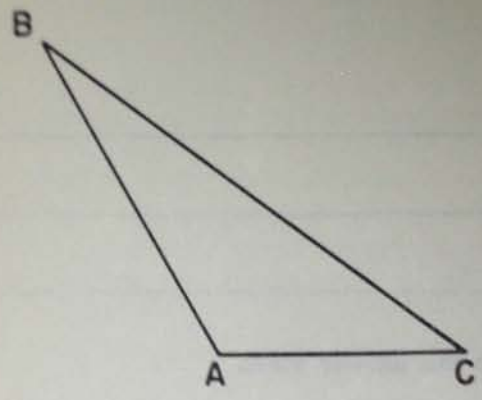
25.....

26.....

27.....

28.....

29



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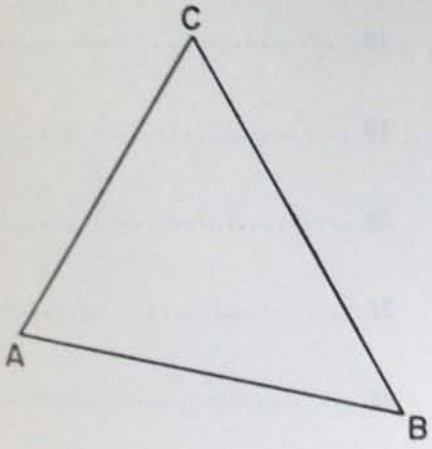

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FOR TEACHERS ONLY

10

SCORING KEY

TENTH YEAR MATHEMATICS

Friday, June 18, 1965 — 1:15 to 4:15 p.m., only

Use only *red* ink or 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 23–28, allow credit if the pupil has written the correct answer instead of the number 1, 2, 3 or 4.

(1) 77

(2) (0,5)

(3) 4

(4) 4

(5) $\sqrt{72}$ or $6\sqrt{2}$

(6) 108

(7) 40

(8) $\frac{n^2 + 3n}{2}$

(9) 16π

(10) 3

(11) 30

(12) $\sqrt{53}$

(13) 50

(14) 100

(15) $\sqrt{35}$

(16) 10

(17) $y = x - 2$

(18) 9

(19) 6

(20) 1260

(21) AB

(22) 36

(23) 1

(24) 3

(25) 2

(26) 3

(27) 3

(28) 4

[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.

(34) *a* 32 [7]
b 35 [3]

(35) *a* 16 [6]
b 2 [4]

(36) *b* $24\frac{1}{2}$ [8]

(37) *a* $x = 3$ [2]
b $y = x - 1$ [2]
d $y = \frac{2}{3}x$ [2]