

The University of the State of New York

261ST HIGH SCHOOL EXAMINATION

PLANE GEOMETRY

Tuesday, August 21, 1934—8 30 to 11 30 a m , only

Instructions

Do not open this sheet until the signal is given

Answer all questions in part I, in part II, answer three questions from group I and two questions from group II

Part I is to be done first and the maximum time to be allowed for this part is one and one half hours Merely place the answer to each question in the space provided, no work need be shown

If you finish part I before the signal to stop is given you may begin part II However, it is advisable to look your work over carefully before proceeding to part II, since *no credit will be given any answer in part I which is not correct and in its simplest form*

When the signal to stop is given at the close of the one and one half hour period, work on part I must cease and this sheet of the question paper must be detached The sheets will then be collected and you should continue with the remainder of the examination

PLANE GEOMETRY

Tuesday, August 21, 1934

Write at top of first page of answer paper (a) names of schools where you have studied, (b) number of weeks and recitations a week in plane geometry previous to entering summer high school, (c) number of recitations in this subject attended in summer high school of 1934

The minimum time requirement previous to entering summer high school is five recitations a week for a school year

For those pupils who have met the time requirement previous to entering summer high school the minimum passing mark is 65 credits, for all others 75 credits

For admission to this examination attendance on at least 30 recitations in this subject in a registered summer high school in 1934 is required

Name the author of the textbook you have used in plane geometry

Part II

Answer five questions from part II, including three questions from group I and two questions from group II

Group I

Answer three questions from this group

- 21 Prove that tangents drawn to a circle from an external point are equal [10]
- 22 Prove that the area of a trapezoid is equal to one half the product of its altitude and the sum of its bases [10]
- 23 In a certain quadrilateral one of the diagonals and the line joining the middle points of a pair of opposite sides bisect each other Prove that the quadrilateral must be a parallelogram [10]
- 24 Prove that in an isosceles triangle any line drawn from the vertex to the base is less than one of the equal sides [10]
- 25 From an external point P a tangent and a secant are drawn to a circle The tangent touches the circle at T and the secant cuts the circle in B and C , B being the point nearer to P At T a chord TD is drawn parallel to BC , and lines TB , TC and DC are drawn Prove that triangle PBT is similar to triangle CDT [10]

Group II

Answer two questions from this group

Leave all work on the paper, merely writing the answers is not sufficient Irrational results may be left in the form of π and radicals unless otherwise stated

- 26 One angle of a rhombus is 60° and the perimeter of the rhombus is 48 inches Find the area of the rhombus and the length of each diagonal [10]
- 27 The area of a regular hexagon is $24\sqrt{3}$ Find the altitude of an equilateral triangle that has a perimeter equal to the perimeter of the hexagon [10]
- 28 A circular swimming pool has a circumference of 44 yards Find, correct to the nearest dollar, the cost at \$2 a square yard of constructing a cement walk 3 feet wide around the pool [Use $\pi = \frac{22}{7}$] [10]
- 29 How far from the center of a circle of radius 12 must a point be selected so that tangents from it to the circle intercept an arc equal to one fifth of the circumference? [Find answer correct to the nearest tenth] [Suggestion Use numerical trigonometry] [10]

PLANE GEOMETRY

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Fill in the following lines:

Name of school

Name of pupil

Detach this sheet and hand it in at the close of the one and one half hour period

Part I

Answer all questions in this part Each correct answer will receive $2\frac{1}{2}$ credits No partial credit will be allowed Each answer must be reduced to its simplest form

Directions (questions 1-17) — Write on the dotted line at the right of each question the expression which when inserted in the corresponding blank will make the statement true

1 Chords equidistant from the center of a circle are always to each other *Ans*

2 Tangents to a circle at the ends of a diameter are to each other *Ans*

3 In the right triangle ABC , hypotenuse AB equals 12 inches, the length of the median drawn from C is inches *Ans*

4 Point A is 13 inches from the center of a circle whose radius is 5 inches, the length of the tangent drawn from A to the circle is inches *Ans*

5 The sides of a right triangle are 8, 15 and 17, the area of the triangle is *Ans*

6 The bisectors of two consecutive angles of a parallelogram form an angle of degrees *Ans*

7 The bisectors of the angles of a triangle meet in a point which is the center of the circle *Ans*

8 A circle can be circumscribed about any polygon *Ans*

9 When the angle of elevation of the sun is 35° , the height of a pole that casts a shadow 40 feet long is feet *Ans*

10 Two chords are drawn across the face of a clock One chord connects the figures 1 and 7, the other connects the figures 2 and 10 The smaller angle formed by the chords contains degrees *Ans*

11 If the opposite angles of a quadrilateral are equal, the figure must be a *Ans*

12 In a right triangle one leg is 8 inches and the hypotenuse is 10 inches, the longer segment of the hypotenuse made by the altitude on it is inches *Ans*

13 The legs of an isosceles trapezoid when prolonged their own length meet in point O If the lower base of the trapezoid is 6 inches, the upper base is inches *Ans*

14 Doubling the area of a circle multiplies the radius by *Ans*

15 A point A is 3 inches from the center of a circle whose diameter is 10, the product of the segments of any chord through A is *Ans*

16 The area of a triangle is 72 square inches and one side is 24 inches If the corresponding side in a similar triangle is 16 inches, its area is square inches *Ans*

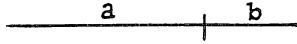
17 A regular pentagon has a central angle of degrees *Ans*

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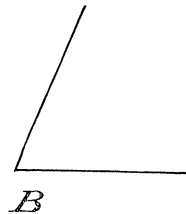
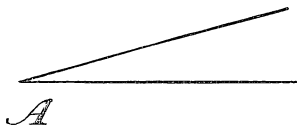
PLANE GEOMETRY — *concluded*

Directions (questions 18–20) — Leave all construction lines on the paper

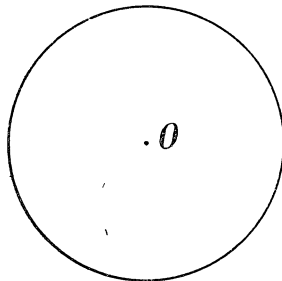
18 Construct the mean proportional between the lines a and b



19 Angles A and B are two angles of triangle ABC , construct angle C



20 Inscribe a regular hexagon in circle O



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