

8 University of the State of New York.

32ND ADVANCED ACADEMIC EXAMINATION,

PLANE GEOMETRY.

TUESDAY, November 20, 1888—Time, 9:30 A. M. to 12:30 P. M. only.

40 credits, necessary to pass, 30.

1. Define and illustrate by a figure each of the following : alternate angles ; perpendicular line ; equilateral triangle ; rhombus ; circumference ; sector 6
2. Mention four cases in which two right-angled triangles are equal to each other..... 4
3. Why is it impossible to construct a triangle whose sides are respectively 5, 10, and 20 feet ?..... 1
4. Mention four cases in which two triangles are similar..... 4
5. How many degrees in an angle inscribed in an arc of 180° ; in an arc of 120° ?..... 2
6. Prove that two parallels are everywhere equally distant... 2
7. Prove that the diagonals of a parallelogram bisect each other..... 2
8. Prove that the radius which is perpendicular to a chord bisects that chord and also the arc subtended by it 2
9. Prove that the square described on the hypotenuse of a right-angled triangle is equivalent to the sum of the squares described on the other two sides..... 4
10. Prove that the perimeters of similar regular polygons are to each other as the radii of their circumscribed or inscribed circles ; and their areas are to each other as the squares of those radii... 4
11. Make and explain the following constructions :
 - (a) To trisect a right angle..... 2
 - (b) The three sides of a triangle being given, to construct the triangle..... 2
 - (c) To construct a fourth proportional to three given straight lines..... 2
12. The chords of a circle intersect ; the segments of one chord are respectively 4 feet and 9 feet, and one segment of the other chord is 8 feet ; find the remaining segment..... 3

 Carefully read and obey the following directions :

 Do you now, at the close of this examination, conscientiously declare that you had no previous knowledge of the questions to be proposed, that you have neither given to any other scholar, nor received from any source, explanation or other aid in answering any of them? If so, write *in the next line after the end of your set of answers*, near the right side of the paper, the words

"I do SO declare."

and underneath *subscribe your name.*

 Every set of papers lacking this *full declaration* and *signature*, however satisfactory, in other respects, will be returned, on the presumption that the required declaration could not conscientiously be made.

 Fold your MS. in proper form for filing, and indorse the last leaf with the name of the institution, your name, the subject, and the date of the examination.