188TH HIGH SCHOOL EXAMINATION

PLANE GEOMETRY

Wednesday, January 24, 1906—9.15 a. m. to 12. 15 p. m., only

Answer six questions but no more, including at least one from each of the three divisions. Each complete answer will receive 16⅔ credits. Papers entitled to 75 or more credits will be accepted.

First division   1 Prove that if three or more parallels intercept equal parts on one transversal, they intercept equal parts on every transversal.

2 Prove that if two triangles have an angle of the one equal to an angle of the other and the including sides proportional, they are similar.

3 Give *three* conclusions to the following and demonstrate *each* of them: If in a right triangle a perpendicular is dropped from the vertex of the right angle to the hypotenuse . . .

Second division   4 Find the length of a tangent drawn to a circle from a point 4 feet from the circumference, the radius of the circle being 30 feet.

5 The sides of a triangle are respectively 28 inches, 25 inches and 17 inches; find the length of the altitude on the longest side.

6 Three angles whose sides are parallel each to each are formed respectively by two radii, two chords and two tangents of a circle; the angle formed by the tangents is 75°. Find the number of degrees in the arcs intercepted by the sides of each angle.

Third division   7 Show how to construct two lines which shall have the ratio of $\sqrt{2}$ to $\sqrt{3}$.

8 Given a circle K and a line L outside the circle; show how to construct a circle tangent to K so that its center shall lie in L and its radius shall be R.

9 The bisectors of the exterior angles at B and C of the triangle ABC meet at D; prove that angle D equals $90° - \frac{1}{2} A$.

10 A chord of the larger of two concentric circles intercepts ⅓ of the circumference and is tangent to the smaller circle; find the ratio of the areas of the two circles.