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Examinations Department

PLANE GEOMETRY

Wednesday, March 16, 1892—9 : 15 a. m. to 12 : 15 p. m., only

40 credits, necessary to pass, 30

NOTE.—Draw carefully and neatly each figure in construction or proof, using letters instead of numerals. Arrange work logically.

1. Define and illustrate (*a*) plane angle ; (*b*) angle at the center ; (*c*) ratio ; (*d*) similar sectors ; (*e*) inscribed polygon.　　　　10

2. If *A* is the angle at the vertex of an isosceles triangle, what is the angle formed by the bisectors of the angles at the base ?　　　2

3. An interior angle of a regular polygon is five-thirds of a right-angle ; find the number of sides.　　　2

4. Prove that an inscribed angle is measured by one-half the arc intercepted between its sides (3 cases).　　　6

5. Prove that two triangles which have their sides parallel or perpendicular each to each are similar.　　　4

6. Prove that the area of a regular polygon equals one-half the product of its perimeter and apothem.　　　3

7. Solve the following and prove the correctness of each construction :

　　(*a*) To construct, on a given straight line, a segment of a circle which shall contain a given angle.　　　5

　　(*b*) On a given line to construct a polygon similar to a given polygon.　　　5

8. The form of the arch of a bridge is the arc of a circle whose radius is 312 feet. The height of the arch is 24 feet, find its span (the chord of the arc).　　　3