P, so that PA = PB. Taking a slightly larger radius, we strike equal arcs from A and from B, intersecting at Q. Triangles PAQ and PBQ have three sides equal respectively, and are, therefore congruent. The corresponding angles, ∠1 and ∠2, are equal, and since their sum is a straight angle, each one is a right angle. The triangles APQ and APB are called right triangles.

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82. Similarity.

Since congruence implies conditions of similarity and equality, the question arises whether either similarity of shape or equality of area can occur independently. Two figures are similar if the corresponding angles are equal and the corresponding lines are proportional. Similarity is made use of in the reverse order from that used in making photographs when building a house from a set of plans. A considerable part of geometry is devoted to establishing minimal conditions for the similarity of triangles and other polygons. It can be shown that two triangles are similar if their corresponding sides are proportional, or if two sides are proportional and the included angles equal, or merely if two angles of one are equal to two angles of the other. This last set of conditions is related to the fact that the sum of the angles of any triangle is a straight angle or 180°. It is apparent that any two right triangles are similar if one of the acute angles of one of the triangles is equal to either acute angle of the other, since each triangle already has a right angle. This fact is the basis for much of the work of elementary trigonometry.

→ If two sides are proportional, Ex.: $\overline{AB} = \overline{CD}$, $\overline{EF} = \overline{OE}$

84. Plane areas.

We consider now equality of areas without necessarily having similarity of figures. Two figures which cover the same amount of surface are equal. They may however differ in shape. In order to determine whether or not two figures are equal in area, there must be some method of measuring area and one section of geometry deals with developing formulas for finding the area of plane figures such as the triangle, rectangle, parallelogram, etc. Most polygons can be divided up

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