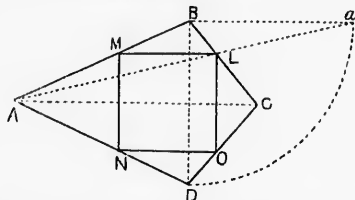


PROBLEM 52.—To INSCRIBE A SQUARE IN A GIVEN TRAPEZIUM $ABCD$ WHOSE ADJACENT SIDES AB , AD AND ALSO BC , CD ARE EQUAL TO ONE ANOTHER.

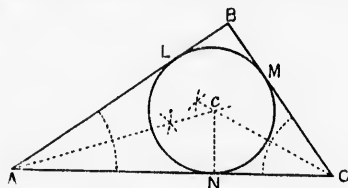


Join AC and BD . Draw BL parallel to AC and make it equal to BD . Draw AL cutting BC in L .

Through L draw a line parallel to AC , meeting AB in M .

Draw LO and MN parallel to BD and join NO , to complete the required square $MNOL$.

PROBLEM 53.—To INSCRIBE A CIRCLE IN A GIVEN TRIANGLE ABC .

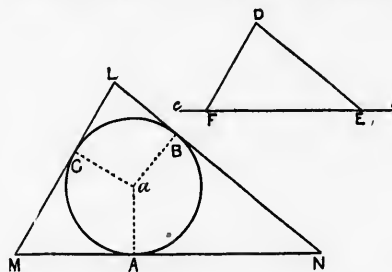


Bisect the angles A and C by the lines Ac , Cc , meeting in c .

Drop a perpendicular cN on AC , and from c as centre with cN as radius, describe the required circle, touching the sides in L , M and N .

PROBLEM 54.—To DESCRIBE A CIRCLE ABOUT A GIVEN TRIANGLE.
(SEE PROBLEM 36).

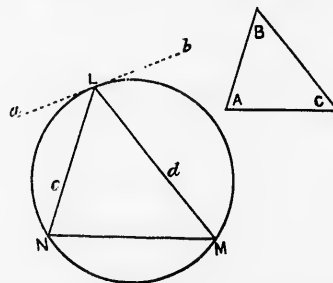
PROBLEM 55.—To DESCRIBE A TRIANGLE SIMILAR TO A GIVEN TRIANGLE DEF ABOUT A GIVEN CIRCLE ABC .



Produce one side of the given triangle DEF and from the centre a of the given circle draw radii making the angles $C'aA$, $A'aB$, respectively equal to the angles cFd and dEb .

At the points A , B and C , draw tangents to the circle, meeting in L , M and N , and forming the required triangle.

PROBLEM 56.—IN A GIVEN CIRCLE TO INSCRIBE A TRIANGLE SIMILAR TO A GIVEN TRIANGLE ABC .



Draw a straight line ab tangent to the circle at a point L .

At L make an angle aLc equal to BAC and an angle bLd equal to BCA .

Produce Lc and Ld to cut the circle in N and M .

Join NM , to complete the required triangle LMN .