

2. Wherefore the angles BHF, HFE, are together less than two right angles.

But straight lines, which with another straight line make the interior angles upon the same side less than two right angles, do meet if produced far enough. (*Axiom 12.*)

3. Therefore HB, FE, shall meet if produced.

CONSTRUCTION.—(II.) 1. Produce HB, FE, towards BE, and let them meet in K.

2. Through K draw KL parallel to EA or FH.

3. Produce HA, GB, to the points L, M.

4. HLKF is a parallelogram, of which the diameter is HK, and AG ME are parallelograms about HK, and LB BF are the complements; LB shall be the parallelogram required.

PROOF.—(II.) 1. Because LB BF are the complements of the whole figure, HLKF, LB is equal to BF. (*Prop. 43, Book I.*)

2. But BF is equal to the triangle C. (*Construction 1.*)

3. Therefore LB is also equal to the triangle C. (*Axiom 1.*)

4. And the angle GBE is equal to the angle ABM. (*Prop. 15, Book I.*)

5. But the angle GBE is equal to the angle D. (*Construction 1.*)

6. Therefore the angle ABM is also equal to the angle D. (*Axiom 1.*)

CONCLUSION.—Therefore the parallelogram LB is applied to the straight line AB, equal to the triangle C, and having the angle AEM, equal to the angle D. Which was to be done.

PROPOSITION 45.—PROBLEM.

To describe a parallelogram, equal to a given rectilineal figure, and having an angle equal to a given rectilineal angle.

GIVEN.—Let ABCD be the given rectilineal figure, and E the given rectilineal angle.

SOUGHT.—It is required to describe a parallelogram equal to ABCD, having an angle equal to E.

CONSTRUCTION.—1. Join DB, (dividing the rectilineal figure ABCD into two triangles, ADB, DBC.)

2. Describe the parallelogram FKHG, equal to the triangle ADB, and having the angle FKH equal to the angle E. (*Prop. 42, Book I.*)

3. To the straight line GH apply the parallelogram