

CONSTRUCTION.—1. On BC describe the square BDEC. (*Prop. 46, Book I.*)

2. On BA, AC, describe the squares ABFG, ACKH. (*Prop. 46, Book I.*)

3. Through A draw AL parallel to BD or CE. (*Prop. 31, Book I.*)

4. Join AD, FC.

PROOF.—1. Because the angle BAC is a right angle (*Hypothesis*), and that the angle BAG is also a right angle. (*Def. 30.*)

2. The two straight lines AC, AG, upon opposite sides of AB, make with it at the point A the adjacent angles equal to two right angles.

3. Therefore CA is in the same straight line with AG. (*Prop. 14, Book I.*)

4. For the same reason AB and AH are in the same straight line.

(*Let the pupil fully shew why AB and AH are in the same straight line.*)

5. And because the angle DBC is equal to the angle FBA (*Axiom 11*), each of them being a right angle (*Definition 30*), add to each the angle ABC.

6. Therefore the whole angle DBA is equal to the whole FBC. (*Axiom 2.*)

7. And because the two sides AB, BD, are equal to the two FB, BC, each to each, and the angle D equal to the angle FBC.

8. Therefore the base AD is equal to the base FC, and the triangle ABD is equal to the triangle FBC. (*Prop. 4, Book I.*)

9. Now the parallelogram BL is double of the triangle ABD, because they are on the same base BD, and between the same parallels BD, AL. (*Prop. 41, Book I.*)

10. And the square GB is double of the triangle FBC, because they are on the same base FB, and between the same parallels FB, GC. (*Prop. 41, Book I.*)

11. But the doubles of equals are equal to one another, therefore the parallelogram BL is equal to the square GB.

12. In the same manner, by joining AE, BK, it can be shewn that the parallelogram CL is equal to the square HC.

(*Let the pupil prove that the parallelogram LC is equal to the square HC.*)

13. Therefore the whole square BDEC is equal to the two squares GB, HC. (*Axiom 2.*)

14. And the square BDEC is described on the straight line BC, and the squares GB, HC, upon BA, AC.