Proposition II. 11

Construct a rectangle on a part of a given straight line equal to the square on the remaining part of the line.

Let the given straight line be AB
Steps:
1) Draw $\Box ABCD$ on AB [Prop.I.46]
2) Bisect AC at E and connect points B and E. [Prop.I.10], [Postulate 1]
3) Extend line CA to F so that FE=EB [Prop.I.3], [Postulate 2]
4) Draw a □ on FA [Prop.I.46]
5) Extend GH to line CD to intersection point K.

**Claim:**
The rectangle contained by AB, BH, namely HBKD is equal to the □ on AH, namely FGHA.

**Proof:**
Rectangle FGKC + □ on AE= □ on FE [Prop.II.6]
EF=EB by construction.
Square on EF=Square on EB [CN.1]
Rectangle FGKC+ □ on AE= □ on EB
Since ∠BAE is right [Prop.I.14], rectangle FGKC+□ on AE=□ on AB [Prop.I.47]
Subtract the □ on AE from both sides
∴ Rectangle FGKC=□ABDC [CN.3]
Subtract rectangle AHKC from both sides
∴ HBKD=FGHA [CN.3]

Q.E.D.

**Comments:** 1. ”Rectangle contained by CB” means the area of the rectangle with side CB. For example, ”rectangle contained by HB” is the shaded rectangle HBDK.