



Proposition I.33

If two straight lines are parallel and of equal length, then the two lines joining them at their extremities are equal and parallel.

Proof:

Let $AB = CD$, $AB \parallel CD$.

Join A to C and B to D .

Claim: $AC = BD$ and $AC \parallel BD$.

Connect BC [post. 1]

Since $AB \parallel CD$, $\alpha = \beta$. [prop. I.29]

$\triangle ABC = \triangle DCB$. [prop. I.4]

So, $AC = BD$

$\delta = \gamma$. [prop. I.4]

$\delta = \gamma \implies AC \parallel BD$. [prop. I.27]

QED