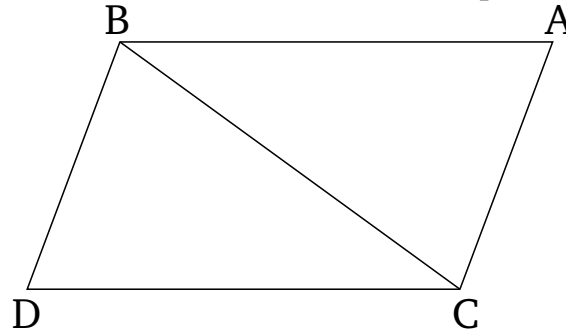# Book 1
Proposition 33

Straight-lines joining equal and parallel (straight-lines) on the same sides are themselves also equal and parallel.

Let AB and CD be equal and parallel (straight-lines), and let the straight-lines AC and BD join them on the same sides. I say that AC and BD are also equal and parallel.

Let BC have been joined. And since AB is parallel to CD, and BC has fallen across them, the alternate angles ABC and BCD are equal to one another [Prop. 1.29] . And since AB is equal to CD, and BC is common, the two (straight-lines) AB, BC are equal to the two (straight-lines) DC, CB.†And the angle ABC is equal to the angle BCD. Thus, the base AC is equal to the base BD, and triangle ABC is equal to triangle DCB, and the remaining angles will be equal to the corresponding remaining angles subtended by the equal sides [Prop. 1.4] . Thus, angle ACB is equal to CBD. Also, since the straight-line BC, (in) falling across the two straight-lines AC and BD, has made the alternate angles (ACB and CBD) equal to one another, AC is thus parallel to BD [Prop. 1.27] . And (AC) was also

shown (to be) equal to (BD).

Thus, straight-lines joining equal and parallel (straight-lines) on the same sides are themselves also equal and parallel. (Which is) the very thing it was required to show.