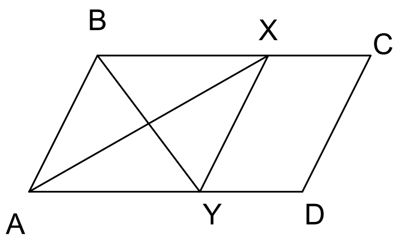
ABCD is a parallelogram. The bisectors of ∠A and ∠B meet |BC and |AD
(produced if necessary) at X and Y respectively.
Prove XY = CD



If ABCD is a parallelogram, then $AB||CD$, $BC||AD$, AB = CD and AD = BC.

In ΔABX $\angle BAX = \angle BXA$ because

$\angle BAX = \angle XAY$ (AX is the bisector ∠A – given)

$\angle BXA = \angle XAY$ (since $BC||AD$ – given), so $\angle BAX = \angle BXA$

Hence ΔABX is an isosceles triangle, so $AB = BX$

In ΔBAY $\angle ABY = \angle AYB$ because

$\angle ABY = \angle YBX$ (BY is the bisector ∠B – given)

$\angle AYB = \angle XBY$ (since $BC||AD$ – given), so $\angle ABY = \angle AYB$

Hence ΔABY is an isosceles triangle, so $AB = AY$

Hence $BX = AY$

In ABXY $BX = AY$ and $BX||AY$ – given, so ABXY is a parallelogram and so AB = XY, but AB = CD – given, so XY = CD.