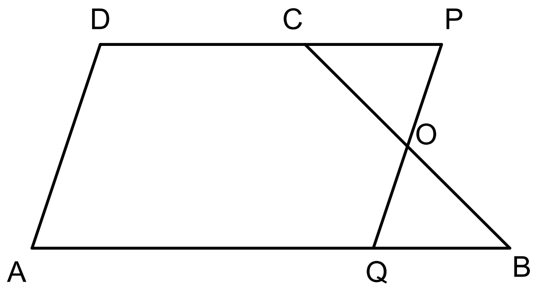
ABCD is a trapezium in which AB is parallel to CD. O is mid point of BC. Through the point O, a line PQ parallel to AD has been dawn which intersects AB at Q and DC produced at P. Prove that ar(ABCD) = ar(AQPD).

Solution:



$Area ABCD = Area AQOCD + Area \Delta QOB$

$Area AQPD = Area AQOCD + Area \Delta POC$

$OC = OB$ (given)

$\angle COP = \angle BOQ$ (vertically opposite angles are equal)

$\angle CPO = \angle BQO$ ($AB || CD$ – given. If the lines are parallel, then the alternate angles are equal)

So $\Delta QOB = \Delta POC$ and so $Area ABCD = Area AQPD$.