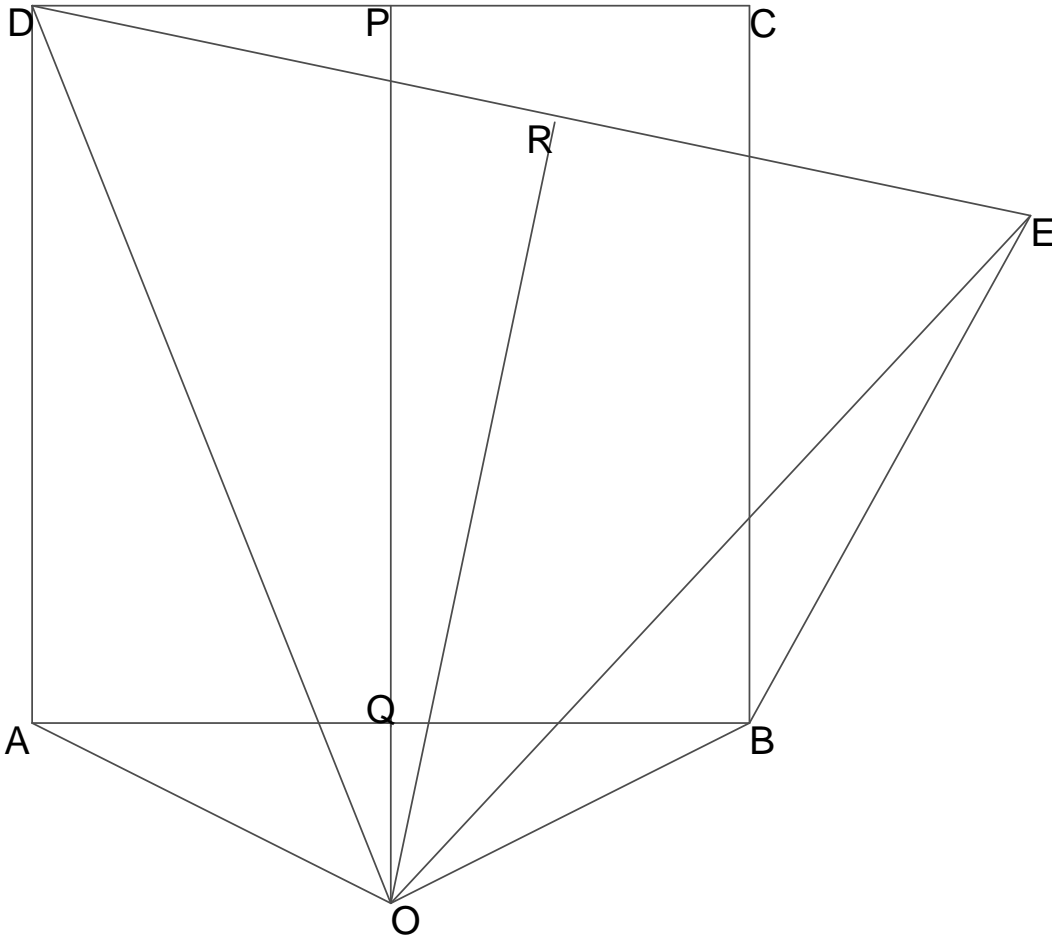


## Every Angle is a Right Angle!?

Let  $ABCD$  be a square and  $E$  be a point with  $BC = BE$ . We will show that  $\angle ABE$  is a right angle. Take  $R$  to be the midpoint of  $DE$ ,  $P$  to be the midpoint of  $DC$ ,  $Q$  to be the midpoint of  $AB$ , and  $O$  to be the point where the lines  $PQ$  and the perpendicular bisector of  $DE$  intersect. (See figure.)



The triangles  $AQO$  and  $BQO$  are congruent since  $OQ$  is the perpendicular bisector of  $AB$ ; it follows that  $AO = BO$ . The triangles  $DRO$  and  $ERO$  are congruent since  $RO$  is the perpendicular bisector of  $DE$ ; it follows that  $DO = EO$ . Now  $DA = BE$  as  $ABCD$  is a square and  $E$  is a point with  $BC = BE$ . Hence the triangles  $OAD$  and  $OBE$  are congruent because the corresponding sides are equal. It follows that  $\angle ABE = \angle OBE - \angle ABO = \angle OAD - \angle BAO = \angle BAD$ .