» Rhombus Investigation

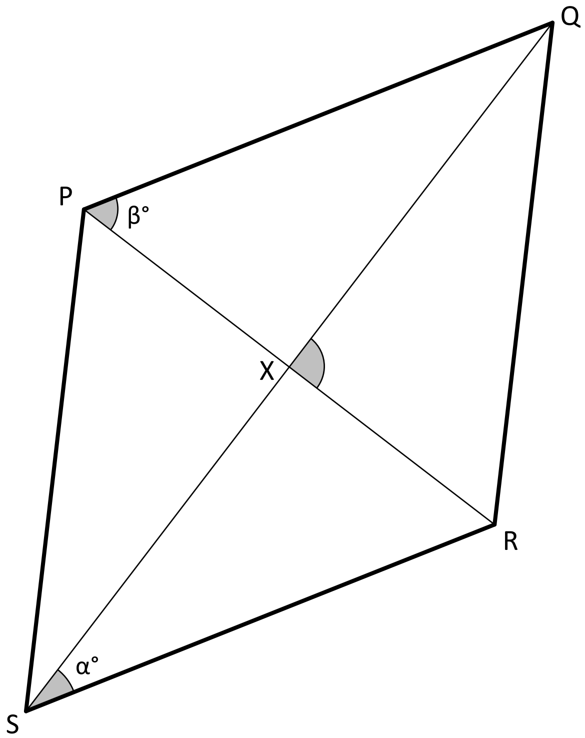
Since the rhombus is such a special quadrilateral, it has a few unusual properties. Consider the following rhombus PQRS. Since by definition it is equilateral,

$PQ = QR = RS = PS$.

PQRS is also a parallelogram, and therefore

$PQ || RS$ and $PS || QR$.

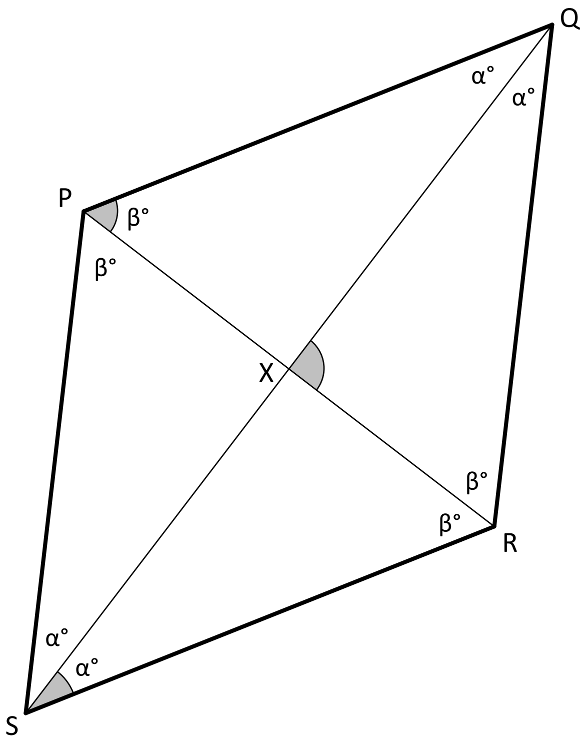
If it is defined that $\angle QSR = \alpha°$ and $\angle QPR = \beta°$, then calculate the size of $\angle QXR$.



» Solution

Since the rhombus is an equilateral figure, the triangles formed by the rhombus's diagonals and sides (e.g. ΔPQS, ΔRQS, ΔPQR, ΔPSR) are isosceles. Using this fact allows us to conclude that several angles within the figure are equal (e.g. $\angle QSR = \angle RQS$).

Once the parallel lines in the figure are also brought into account, we can use alternate angles to show numerous angles to be equal (e.g. $\angle QSR = \angle PQS$). After this procedure is complete, then the diagram's angles should be marked in terms of α & β as shown below.



From this it should be evident that all four of the angles at the point X are equal. Since angles at a point sum to 360°,

$\angle PXQ = \angle PXS = \angle RXS = \angle QXR = 90°$.

Quod erat demonstrandum. From this we can generalise and conclude that **diagonals in a rhombus are perpendicular.**