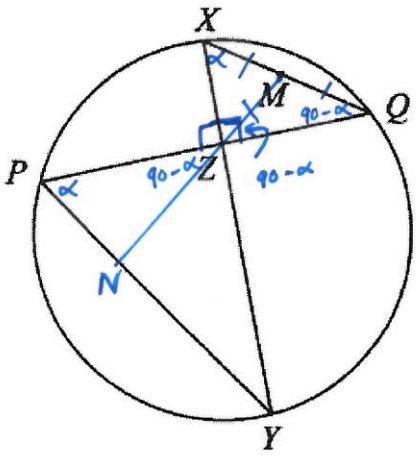
CSSA 2008 Q4

(a) Two perpendicular chords PQ and XY of a circle intersect at Z. 3



NOT TO SCALE

Copy or trace the diagram into your writing booklet.

If M is the midpoint of the chord QX, prove that MZ produced is perpendicular to the chord PY.

$\angle XZQ = 90^\circ$ ($PQ \perp XY$)

$\therefore$ Z, X and Q are concyclic with diameter XQ and centre M.

$\therefore$ $MZ = MQ = XM$ (equal radii of a circle)

let $\angle ZXQ = \alpha$

$\therefore \angle XQZ = 90 - \alpha$ (angle sum of a triangle)

$\therefore \angle MZQ = 90 - \alpha$ (angles opposite = sides are =)

$\therefore \angle PZN = 90 - \alpha$ (vertically opposite angles)

$\therefore \angle ZNP = 180 - \alpha - (90 - \alpha)$

$= 180 - \alpha - 90 + \alpha$

$= 90$ (angle sum of a triangle)

$\therefore$ MZ produced is $\perp$ to chord PY.