

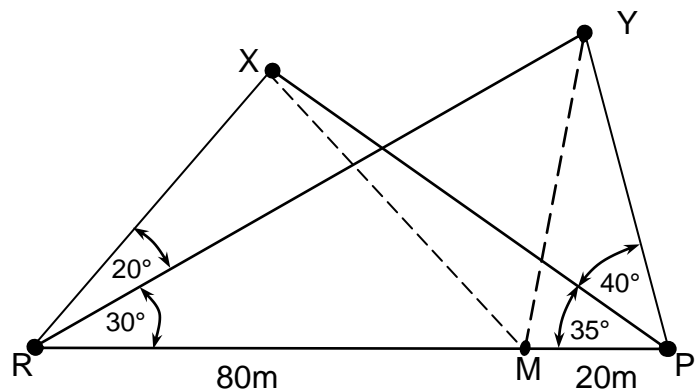
MATHEMATICS

Level Two

“Three Friends”

Setting: Three friends Monica, Phoebe and Rachel are attempting to determine the distance between two distant objects by using surveying theodolites (a device that surveyors use to measure angles).

Rachel has a theodolite at one end of a 100m straight line and Phoebe has another theodolite at the other end. They take sightings of the two distant objects (X and Y) and record the angles shown on the diagram below.



Monica is positioned with a third theodolite on the line between Rachel and Phoebe at a distance of 20m from Phoebe.

Calculate the angle \hat{XMY}

Task B

A large pond obstructs the survey line AB. Calculate the missing length PQ.

