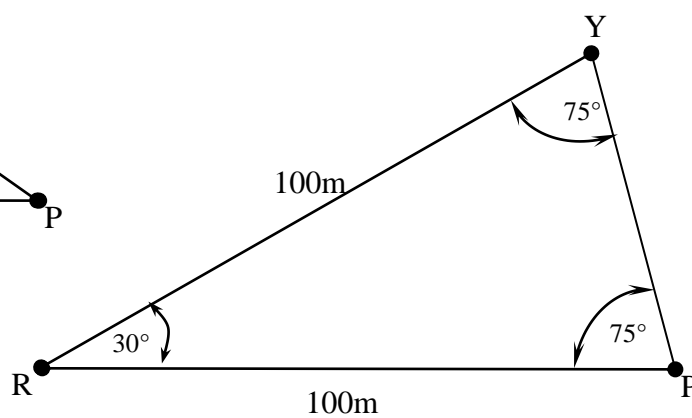
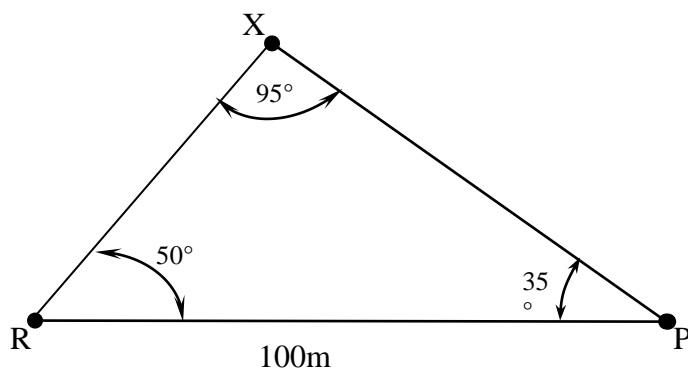
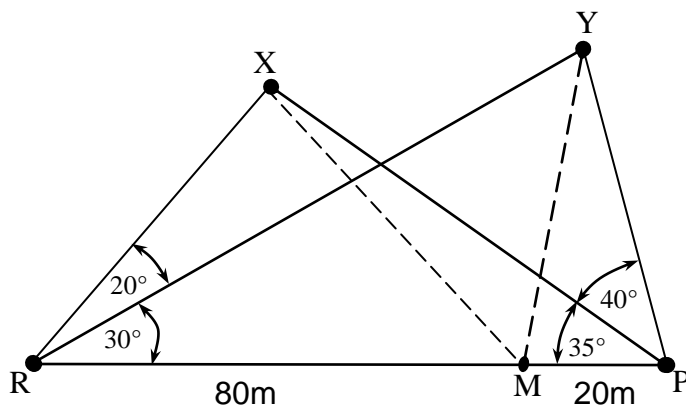


MATHEMATICS ANSWERS

Level Two

“Three Friends”

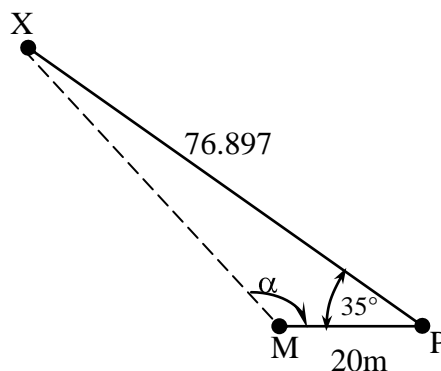


Note YPR is an isosceles triangle, so you can use this fact, or the sine rule...

$$XP = \frac{100 \times \sin 50^\circ}{\sin 95^\circ} = 76.897m$$

$$XR = \frac{100 \times \sin 35^\circ}{\sin 95^\circ} = 57.577m$$

$$YP = \frac{100 \times \sin 30^\circ}{\sin 75^\circ} = 51.764m$$



COSINE RULE

$$XM^2 = 20^2 + 76.897^2 - 2 \times 20 \times 76.897 \times \cos 35^\circ$$

$$XM = 61.592$$

$$MY^2 = 20^2 + 51.764^2 - 2 \times 20 \times 51.764 \times \cos 75^\circ$$

$$MY = 50.434$$

$$\sin \beta = \frac{51.764 \times \sin 75^\circ}{50.434}$$

$$= 0.991398$$

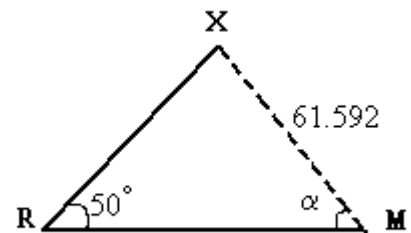
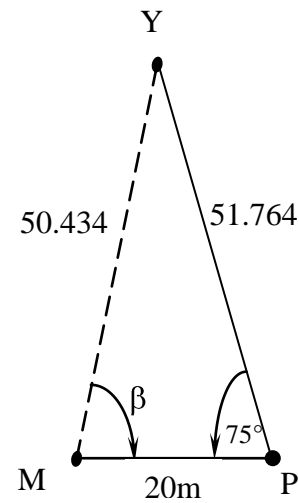
$$\beta = 82^\circ 28' 47''$$

$$\frac{\sin(\alpha)}{57.577} = \frac{\sin 50^\circ}{61.592}$$

$$\alpha = 45^\circ 44' 03''$$

THEREFORE, $180^\circ - 82^\circ 28' 47'' - 45^\circ 44' 03'' = \angle XMY$

$$\hat{XMY} = 51^\circ 47' 10''$$



TASK B

$$PQ = 5.6\text{m}$$

There are many options for finding this solution. Trig ratios could be used, but so could scale factors for an enlargement...