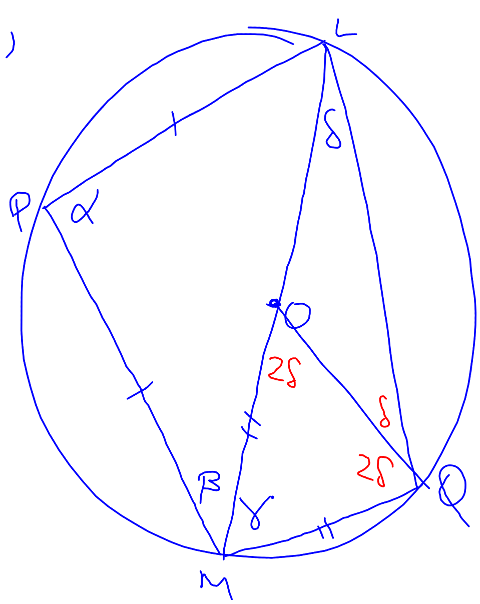
1 i)



$\alpha = 90$

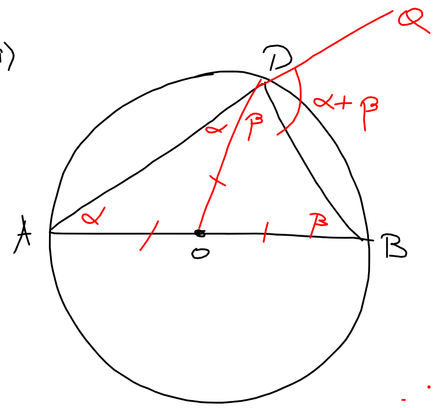
$\beta = 45$

$3\delta = 90$

$\delta = 30$

$\therefore \gamma = 60.$

6a)



$\angle QPB = \angle PAB + \angle PBA$ (exterior $\angle$, $\triangle PBA$)

$\angle QPB = \underline{\alpha + \beta}$

$\angle APB = \angle APO + \angle BPO$ (common $\angle$)

$\triangle AOP$ is isosceles ($OA = OP$ = radii)

$\therefore \angle OPA = \angle PAO = \alpha$ (base $\angle$s isosceles $\triangle AOP$)

Similarly in $\triangle OBP$

$\angle OBP = \angle OPB = \beta$

$\therefore \underline{\angle APB = \alpha + \beta}$

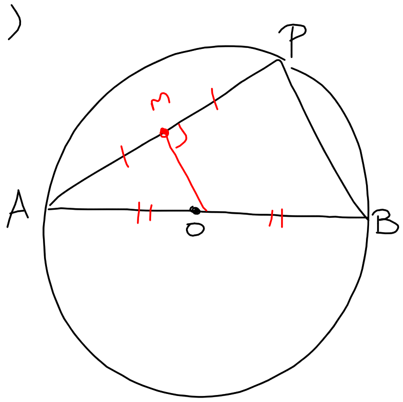
$\angle APO + \angle OPB + \angle BPQ = 180°$ (straight $\angle APQ$)

$\alpha + \beta + \alpha + \beta = 180$

$\alpha + \beta = 90$

$\therefore \underline{\angle APB = 90°}$

6c)



$AM = PM$ (given)

$OM \perp AP$ ($\perp$ centre, bisects chord)

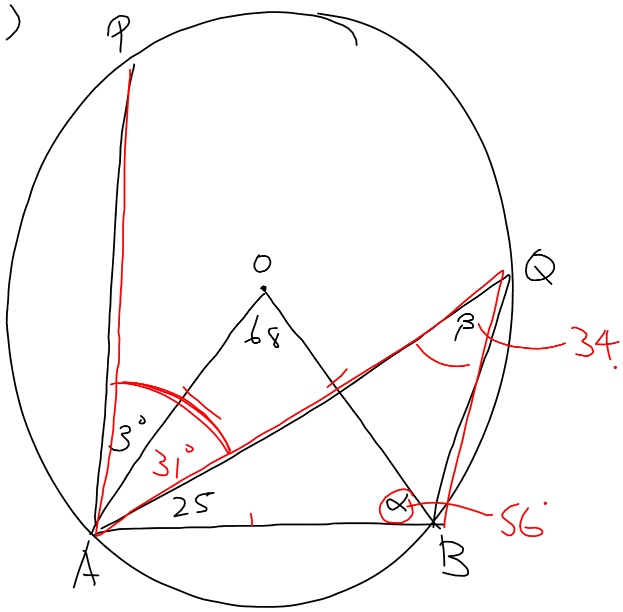
$AO = BO$ (= radii)

$\therefore \dfrac{AM}{MP} = \dfrac{AO}{BO} = \dfrac{1}{1}$

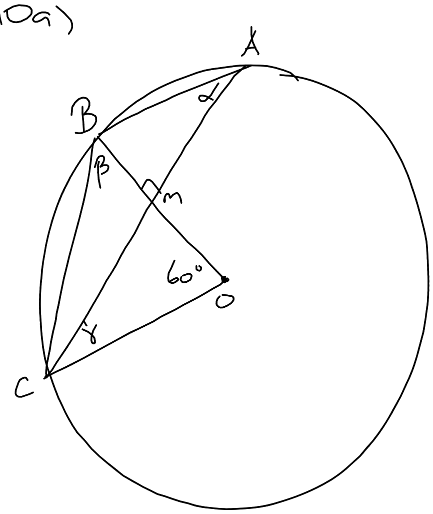
Thus $MO \parallel PB$ (ratio of intercepts of $\parallel$ lines)

$\angle APB = \angle AMO = 90^\circ$ (corresponding $\angle$'s, $MO \parallel PB$)

8 c)



10a)



$\angle BOC = 2\angle BAC$ (∠ at centre, twice ∠ at circumference on same arc)

$60 = 2\alpha$

$\underline{\alpha = 30}$

$\angle CMO + \angle MOC + \angle OCM = 180$ (∠ sum △MOC)

$90 + 60 + \gamma = 180$

$\underline{\gamma = 30}$

$OB = OC$ (= radii)

∴ △OBC is isosceles

But $\angle BOC = 60°$

∴ △OBC is equilateral (non base ∠ = 60°)

$\angle CBO = \underline{\beta = 60°}$

In △BMO and △OMC

$\angle BMO = \angle OMC = 90°$ (given)

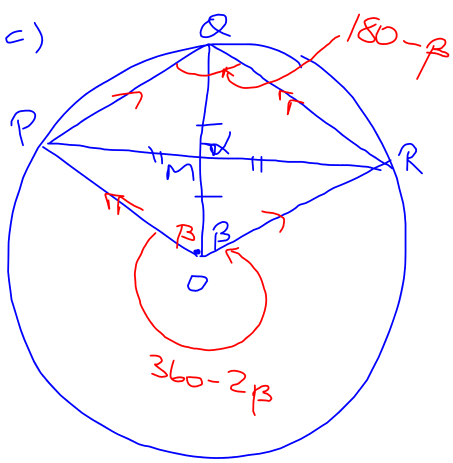
$BC = OC$ (sides in equilateral △OBC)

$MC = MC$ (common side)

∴ △BMO ≡ △OMC (RHS)

$\underline{MB = OM}$ (matching sides in ≡ △'s)

10c)

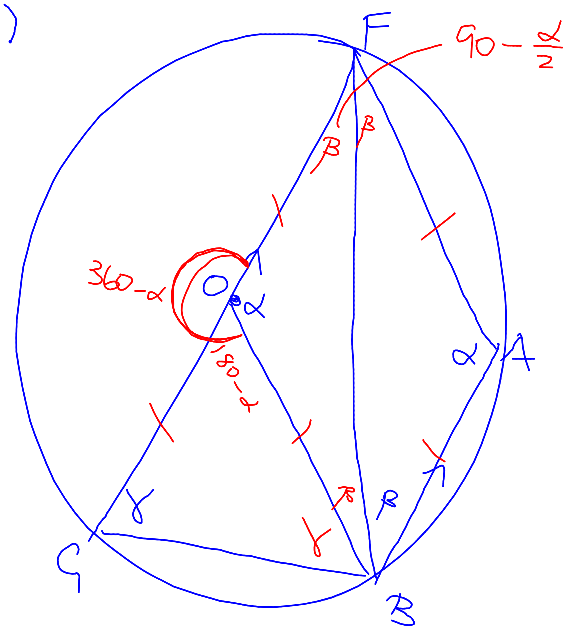


$180-\beta = 2\beta$

$3\beta = 180$

$\underline{\beta = 60}$

11c)



$*\ \beta+\gamma = 90$ (∠ in semicircle)

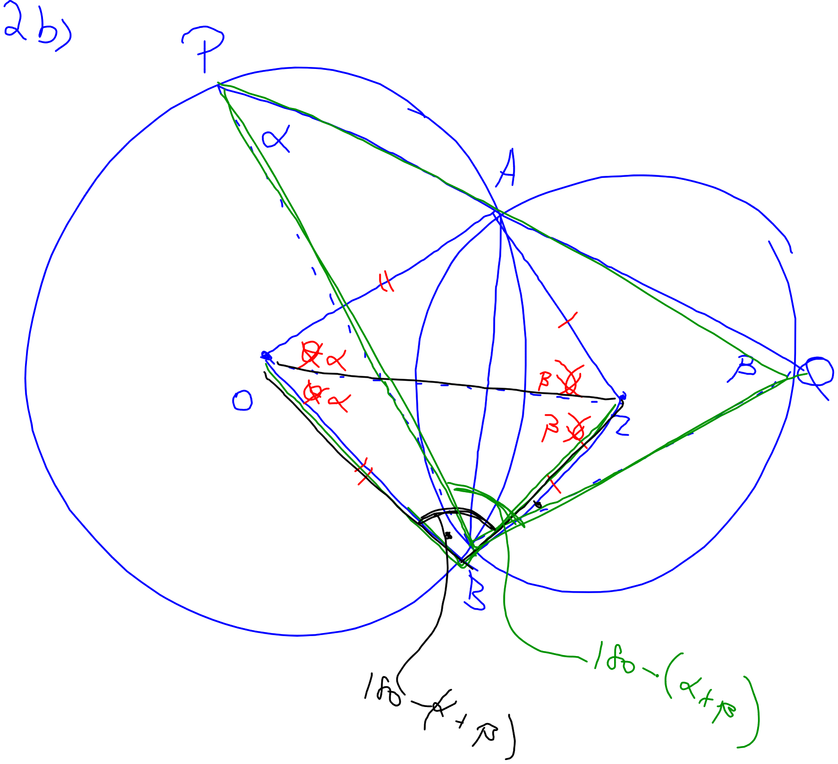
$\alpha = 2\gamma$ (∠ at centre, twice ∠ at circumference on FB)

$*\ \alpha = 180-2\beta$ (∠ sum △)

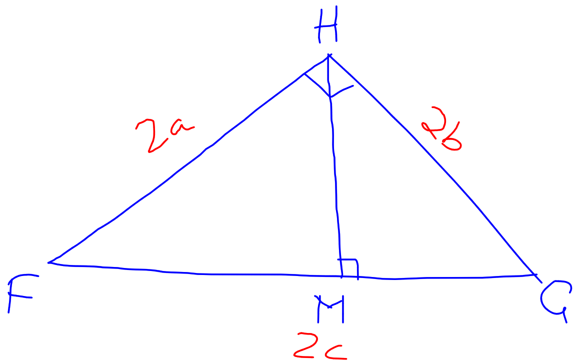
$360-\alpha = 2\alpha$

$\underline{\alpha = 120^\circ}$, $\underline{\gamma = 60^\circ}$, $\underline{\beta = 30^\circ}$

12 b)



13a(iii)



$4c^2 = 4a^2 + 4b^2$

$c^2 = a^2 + b^2$

$A_{circle_{HMG}} = \pi b^2$

$A_{circle_{HMF}} = \pi a^2$

$\pi(a^2+b^2)$

$= \pi c^2$

$= A_{circle_{HFG}}$

13b (me)