Q10

$\hat{B}_3 = x$, $\hat{B}_2 = 90°$

let $\hat{B}_1 = y$, so, $x + y = 90°$.

$\hat{B}_3 = \hat{D}_2 = x$. a bet tan & ch.

In ΔDBE: $\hat{D}_2 = x$, so $\hat{E} = y$.

In ΔMEF: $\hat{M}_2 = 90°$,

so $\hat{F}_1 = x$

$\Rightarrow \hat{B}_3 = \hat{F}_1 = x$.

$\Delta CBD \,|||\, CBE$

C is common

$\hat{B}_1 = \hat{E}$ prove.

$\Delta CBD \,|||\, CBE$ ($\angle\angle\angle$)

10.2.1 $BC^2 = CD \times CE = 2 \times 8 = 16$

$BC = \underline{\underline{4}}$.

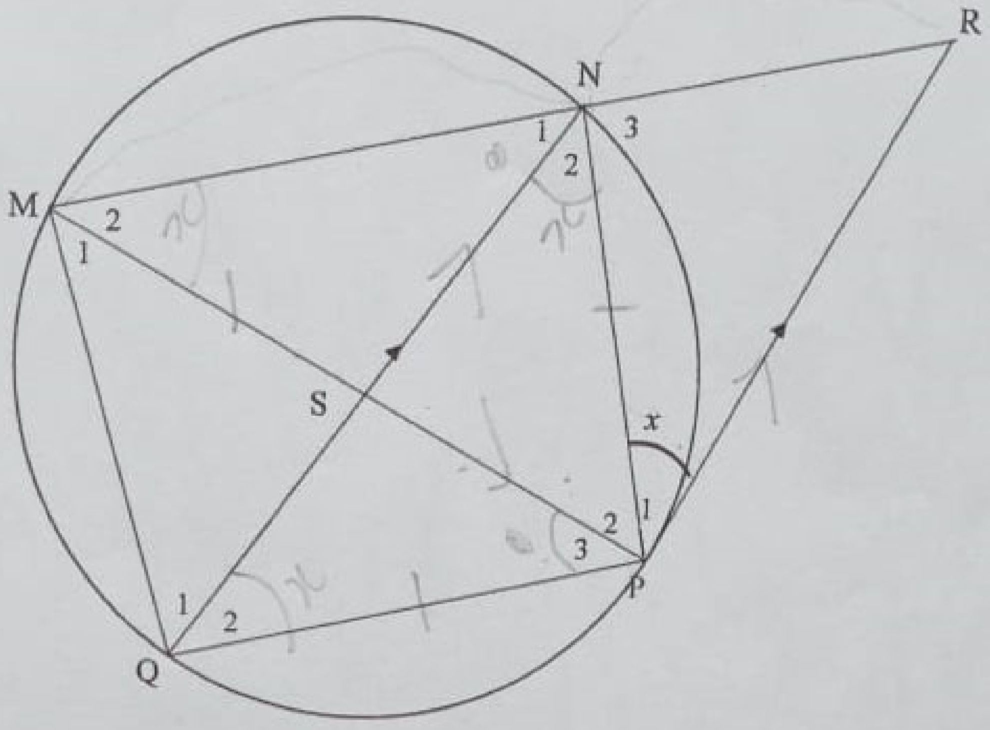
10.2.2 $\frac{CD}{CB} = \frac{1}{2} = \frac{DB}{BE} = \frac{x}{2x}$

But $DB^2 + BE^2 = DE^2 = 6^2 = 36$

$x^2 + (2x)^2 = 36$

$5x^2 = 36$ $\quad x = \sqrt{\frac{36}{5}} = \sqrt{7{,}2}$

9.2 Chord QN bisects $M\hat{N}P$ and intersects chord MP at S. The tangent at P meets MN produced at R such that $QN \parallel PR$. Let $\hat{P}_1 = x$.



9.2.1 Determine the following angles in terms of x. Give reasons

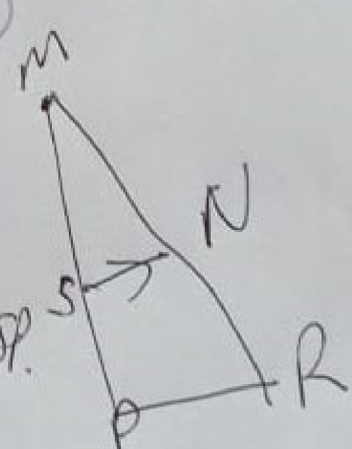
(a) $\hat{N}_2 = \hat{P}_1 = x$ .. $NQ \parallel RP$ alt ∠s (2)

(b) $\hat{Q}_2 = \hat{P}_1 = x$ ∠ bet tang & ch. (2)

9.2.2 Prove, giving reasons, that $\frac{MN}{NR} = \frac{MS}{SQ}$ (6)

$MN \parallel PR$

$\therefore \frac{MN}{NR} = \frac{MS}{SP}$



show SQP isos Δ. now sub for SP

ie $\hat{Q}_2 = \hat{P}_3 = x$

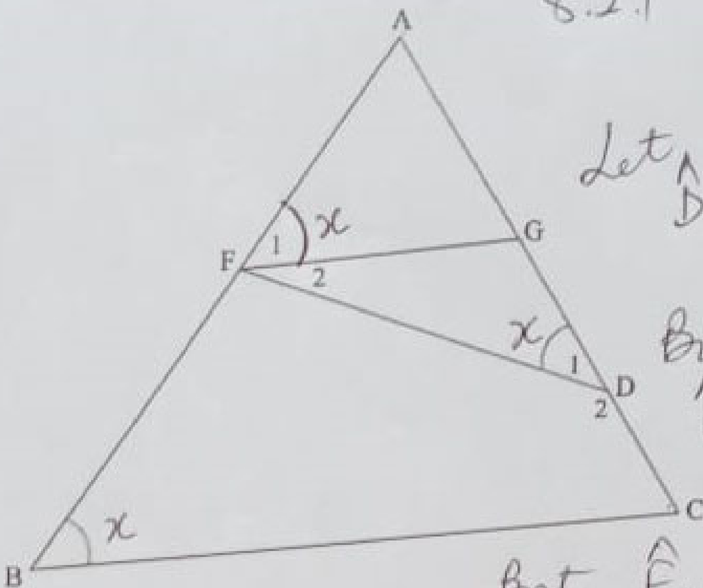
$\Rightarrow SQ = SP$.

[15]

Please turn over

8.2 In ΔABC, F and G are points on sides AB and AC respectively. D is a point on GC such that $\hat{D}_1 = \hat{B}$.

8.2.1



Let $\hat{D}_1 = \hat{B} = x$

given

But

$\hat{F}_1 = \hat{D}_1 = x$

∠ bet tan & chord

But $\hat{F}_1 = \hat{B} = x$

$\Rightarrow FD \parallel BC$ corr ∠s

8.2.1 If AF is a tangent to the circle passing through points F, G and D, then prove, giving reasons, that $FG \parallel BC$. (4)

8.2.2 If it is further given that $\frac{AF}{FB} = \frac{2}{5}$, $AC = 2x - 6$ and $GC = x + 9$, then calculate the value of x. (4)

[17]

$$\frac{AF}{FB} = \frac{AD}{GC} = \frac{2}{5}$$

$$AC - GC = AG = (2x-6) - (x+9)$$

$$= x - 15$$

$$\therefore \frac{AG}{GC} = \left(\frac{2}{5} = \frac{x-15}{x+9}\right) \text{ Solve}$$

$$x = 31$$