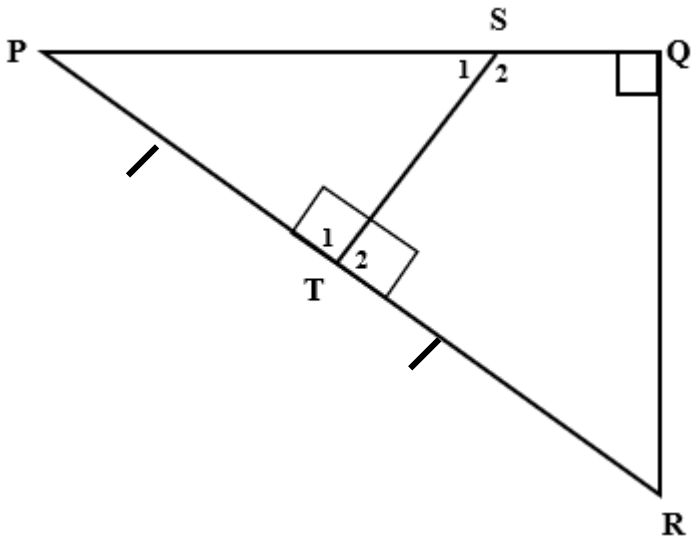
Gr. 12

Totaal: 45
Tyd: 55 min

Kwartaal 3, Toets 2 (Euklidiese meetkunde & eweredigheidstelling) 2025 – Memorandum

Vraag 1

In die onderstaande diagram is ΔPQR 'n reghoekige driehoek met $\hat{Q} = 90°$.
ST halveer PR loodreg.



1.1 Bewys dat $\Delta PQR /// \Delta PTS$. (3)

$\hat{Q} = \hat{T}_1 = 90°$ [Gegee] √
$\hat{P}$ is gemeen√
$\hat{R} = \hat{S}_1$ [Binne L'e van Δ]
$\Delta PQR /// \Delta PTS$ [L; L; L] √

1.2 Indien $PR = 35\ cm$ en $QR = 21\ cm$, bereken:

1.2.1 die lengte van PS. (5)

$PQ^2 = 35^2 - 21^2$ [Pyth] √
$PQ^2 = 784$
$PQ = 28\ cm$ √
$\frac{PQ}{PT} = \frac{QR}{TS} = \frac{PR}{PS}$ [$\Delta PQR /// \Delta PTS$]
$\frac{28}{17{,}5\surd} = \frac{21}{TS} = \frac{35}{PS}$ √
$35 \times 17{,}5 = 28 \times PS$
$PS = 21{,}88\ cm$ √

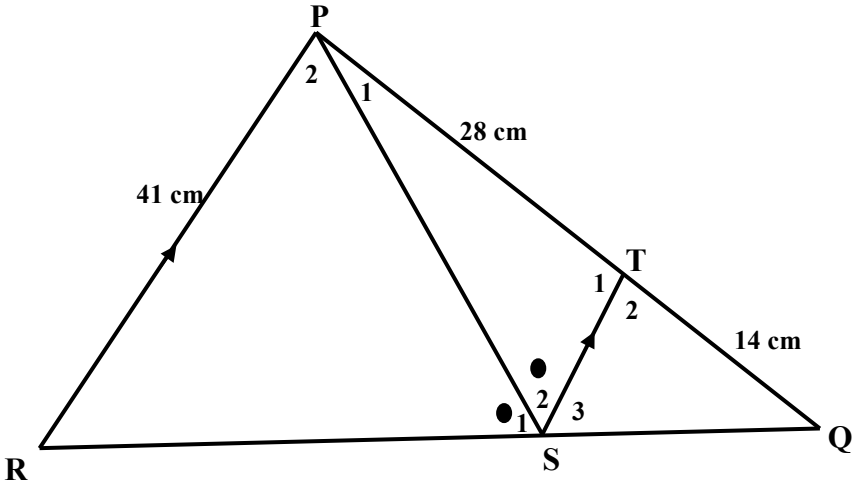
1.2.2 die omtrek van ΔPQR. (2)

$= 28 + 21 + 35$ √
$= 84\ cm$ √

[10]

Vraag 2

In die onderstaande diagram is $PR = 41\ cm,\ PT = 28\ cm$ en $TQ = 14\ cm$.
$ST // PR$ en $\hat{S}_1 = \hat{S}_2$.



2.1 Bepaal die lengte van SQ. (5)

$\hat{S}_2 = \hat{P}_2$ [Verwisselende L'e; PR//ST] √
$RS = 41\ cm$ [Sye teenoor = L'e] √
$\frac{SQ}{RS} = \frac{TQ}{PT}$ [Lyn // aan sy van Δ]√
$\frac{SQ}{41} = \frac{14}{28}$ √
$SQ = 20{,}5\ cm$ √

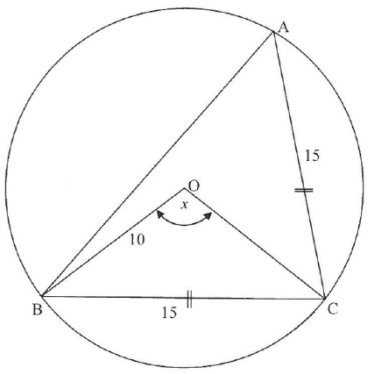
2.2 Bepaal die lengte van ST. (5)

In ΔPQR en ΔTQS
$\hat{Q}$ is gemeenskaplik√
$\hat{P} = \hat{T}_2$ EN $\hat{P} = \hat{S}_3$ [Ooreenkomstige L'e; PR//TS] √
$\Delta PQR \,///\, \Delta TQS$ [L; L; L] √
$\frac{42}{14} = \frac{QR}{QS} = \frac{41}{TS}$ [$\Delta PQR \,///\, \Delta TQS$] √
$TS = \frac{41 \times 14}{42}$
$TS = 13{,}67\ cm$√

[10]

Vraag 3

In die onderstaande diagram is O die middelpunt van die sirkel. $AC = BC$ en $OB = 10\ cm$.



3.1 Bereken, met redes, die grootte van x. (4)

$BC^2 = OB^2 + OC^2 - 2.OB.OC.cosx$√
$15^2 = 10^2 + 10^2 - 2.10.10.cosx$ [OB=OC=10; radii] √*sub*
$cosx = -0{,}125$ √
$x = 180° - 82{,}82°$
$x = 97{,}18°$√

3.2 Bereken, met redes, die grootte van $A\hat{C}B$. (3)

$B\hat{A}C = 48{,}59°$ [MiddelpuntsL = 2xOmtreksL] √

$A\hat{B}C = 48{,}59°$ [L'e teenoor = sye] √
$A\hat{C}B = 82{,}82°$ [Binne L'e van Δ]√

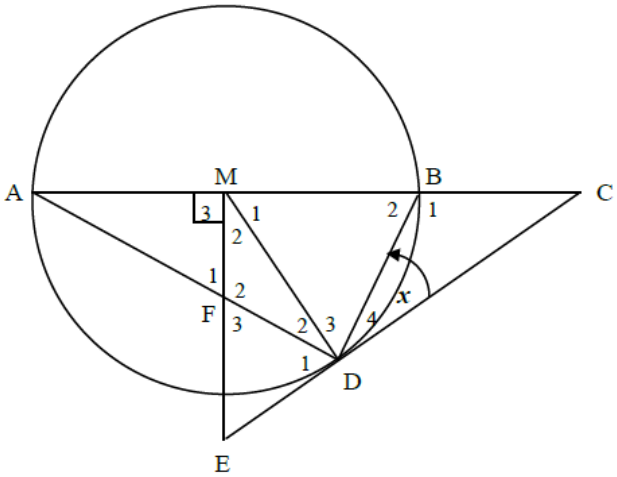
3.3 Bereken die area van ΔABC. (3)

$A = \frac{1}{2}.AC.BC.sinC$ √
$A = \frac{1}{2}.15.15.sin82{,}82°$ √
$A = 111{,}62\ cm^2$√

[10]

Vraag 4

In die onderstaande skets is M die middelpunt van die sirkel. CE is 'n raaklyn aan die sirkel by D en $MB = 2BC$. Laat $\hat{D}_4 = x$.



4.1 Bewys dat $FMBD$ 'n koordevierhoek is. (3)

$\hat{D}_{2+3} = 90°$ [L in semi O]√ *hoek en rede*
$\hat{M}_{1+2} = 90°$ [L'e op 'n reguitlyn]]√ *hoek en rede*
$\therefore \hat{D}_{2+3} + \hat{M}_{1+2} = 180°$
$\therefore$ $FMBD$ is 'n koordevierhoek [Teenoorstaande L'e is supplementêr]]√

4.2 Bewys dat: $DC^2 = 5BC^2$. (9)

$\hat{A} = \hat{D}_4 = x$√ [L tussen raaklyn en koord] √

$\widehat{D}_{2+3+4} = \widehat{B}_1 = 90° + x$√ [Buite L van Δ]√
DC is gemeen√
$\Delta ADC /// \Delta DBC$ [L; L; S] √
$\frac{DC}{BC} = \frac{AC}{DC}$ [$\Delta ADC /// \Delta DBC$] √
$DC^2 = AC.BC$
$DC^2 = 5BC.BC$ [AM = MB; Radii] √
$DC^2 = 5BC^2$ √

4.3 Vervolgens, en as $\Delta DBC /// \Delta DFM$, bepaal die waarde van $\frac{DM}{FM}$. (3)

$\frac{BC}{FM} = \frac{DC}{DM}$ [ΔDBC /// ΔDFM] √
$\frac{DM}{FM} = \frac{DC}{BC}$
$DC^2 = 5BC^2$
$DC = \sqrt{5}BC$ √
$\frac{DM}{FM} = \frac{\sqrt{5}BC}{BC}$
$\frac{DM}{FM} = \sqrt{5}$ √

[15]

Totaal: [45]