Graad 7 – Boek C

(Onderwysers Handleiding)

(Hersiene KABV uitgawe)

INHOUDSOPGAWE:

	Bladsy:
C1. Konstruksie en meting	3
C2. Meetkunde van 2-D figure	19
C3. Omtrek en oppervlak	47
C4. Drie-dimensionele vorms	81
C5. Transformasies	101

Hierdie boek is in 2013 opgestel en verwerk deur E.J. Du Toit.

Kontaknommer: 086 618 3709 (Faks)

Kopiereg © 2013. Alle kopiereg word voorbehou. Geen deel van hierdie publikasie mag in enige vorm gereproduseer word nie, tensy skriftelike toestemming daarvoor verkry is.

ISBN 978-1-919957-28-9

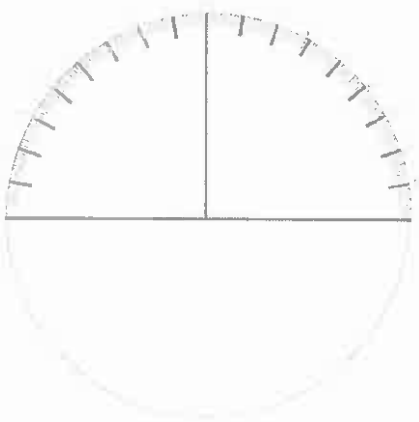
Hoofstuk C1

Konstruksie en meting

C1.1 Hoeke:

Hoeke word hoofsaaklik in grade gemeet. Ons maak gebruik van `n gradeboog om hoeke te meet.

`n Sirkel (omwenteling) word ingedeel in 360 grade - 360°.
`n Gradeboog stel gewoonlik `n halwe omwenteling van 180° voor.

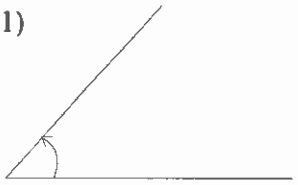


Elke graad word ingedeel in 60 minute.
Elke minuut word ingedeel in 60 sekondes!
Dit word as 20° 12` 24`` geskryf
∴ 20 grade 12 minute en 24 sekondes

Oefening 1: Datum: _____

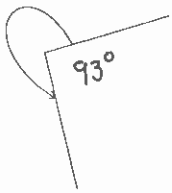
Gebruik `n gradeboog en meet elk van die volgende hoeke korrek tot die naaste graad:

(1)



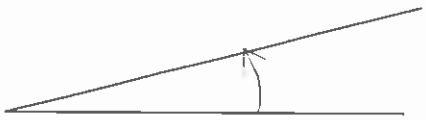
47°

(2)



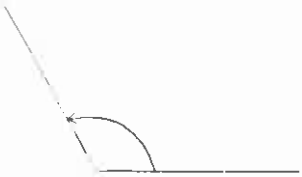
∴ 360° − 93° = 267°

(3)



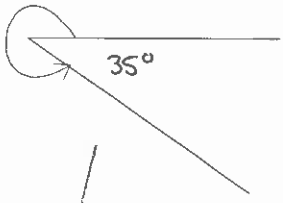
14°

(4)



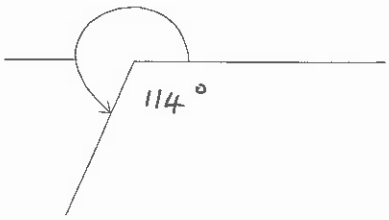
119°

(5)



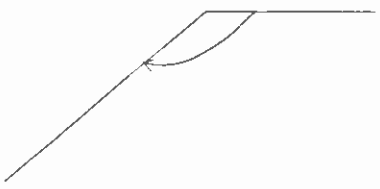
∴ 360° − 35° = 325°

(6)



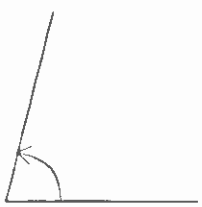
∴ 360° − 114° = 246°

(7)



140°

(8)



76°

(9)

180°

☺ **Hoeke kan ook in ander eenhede as in grade gemeet word. Doen navorsing en gee twee ander eenhede waarin hoeke gemeet kan word.**

Radiale

Gradiënte

C1.2 Konstruksies:

C1.2.1 Lyne en hoeke:

Maak hier gebruik van 'n liniaal, gradeboog, passer en skerp potlood.

Vb.1 Konstrueer die volgende: $A\hat{B}C = 40^o$ met $BC = 50$ mm.

****

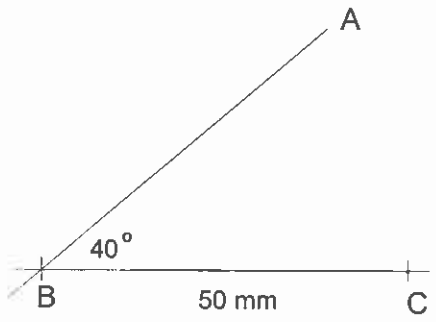
(a) Trek eers enige horisontale lyn met potlood en liniaal.

(b) Maak nou 'n merk op die lyn en benoem dit B.

(c) Gebruik 'n passer en merk 50 mm op 'n liniaal af.

(d) Merk vanaf B, op die horisontale lyn, C af met die passer wat dan 50 mm vanaf B is.

(e) Gebruik 'n gradeboog en meet 'n hoek van 40^o by B af.



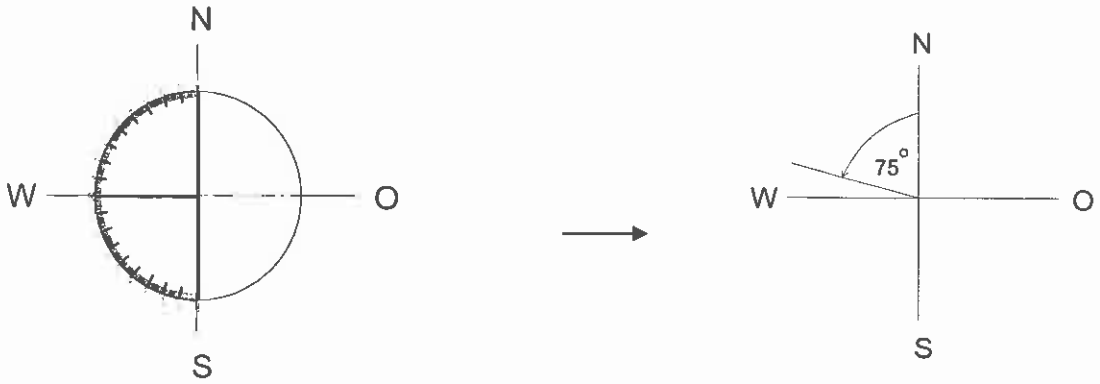
Vb.2 Konstrueer 'n hoek, 75^o wes van noord.

****

(a) Trek eers die vier hoof kompasrigtings in.

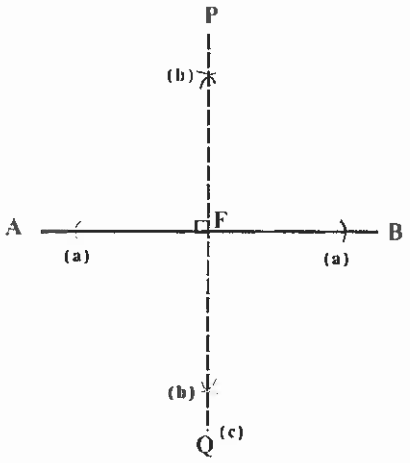
(b) Plaas 'n gradeboog, met middelpunt by A en 0^o by N (Noord). Die 90^o moet op W (Wes) wees.

(c) Merk nou die hoek by 75^o af. Meet antikloksgewys.



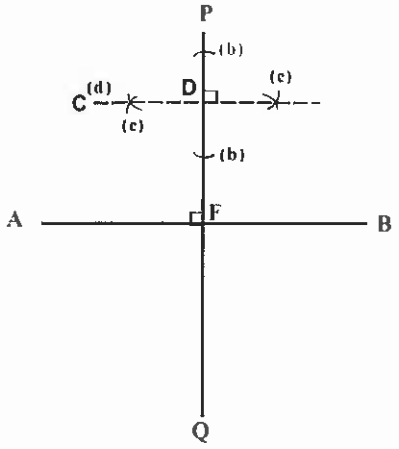
Vb.3 Trek 'n loodlyn deur F.

(a) Trek enige lyn AB en merk F op die lyn.
(b) Plaas passerpunt op F en maak bogies aan weerskante van F.
(c) Plaas passerpunt nou op beide (a)'s aan weerskante van F en maak "kruisbogies" aan weerskante van AFB sodat dit die bogies in (b) sny.
(d) Verbind die snypunte van die twee bogies.
(e) $\therefore PQ \perp AFB$, m.a.w. $P\hat{F}B = 90°$.



Vb.4 Trek lyn AB en dan CD // AB .

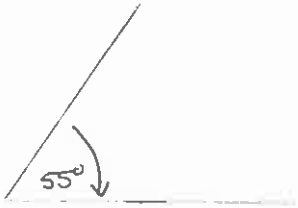
(a) Volg stappe (a) – (e) soos in voorbeeld 3.
(b) Plaas passerpunt op D en maak bogies aan weerskante van D.
(c) Plaas passerpunt nou op beide (b)'s aan weerskante van D en maak "kruisbogies" aan weerskante van PDF sodat dit die bogies in (c) sny.
(d) Verbind die snypunte van die twee bogies.
(e) $\therefore CD \perp PFQ$, m.a.w. $P\hat{D}C = 90°$ en $CD // AB$.



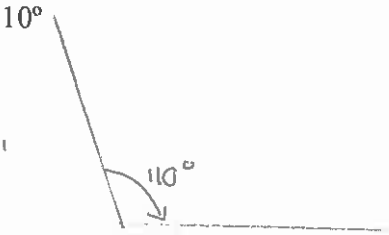
Oefening 2: Datum: _____

(1) Konstrueer die volgende hoeke:

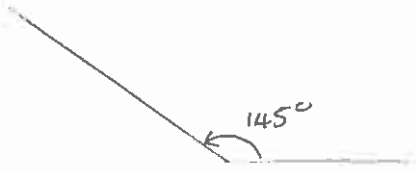
(a) $A\hat{B}C = 55°$



(b) $P\hat{Q}R = 110°$

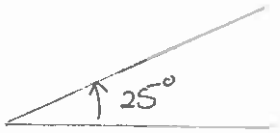


(c) $R\hat{Q}P = 145°$

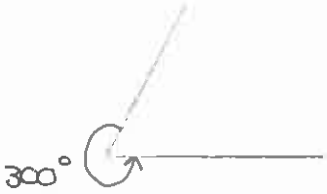


(d) $A\hat{B}C = 90°$

(e) $K\hat{M}N = 25°$

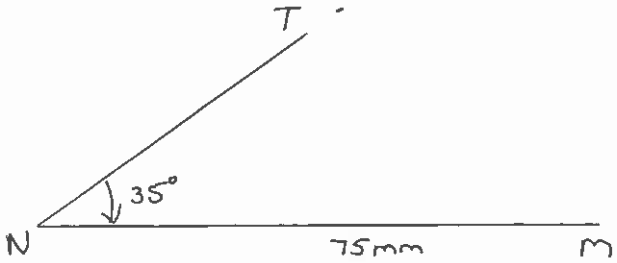


(f) $R\hat{S}T = 300° = 360° - 60°$

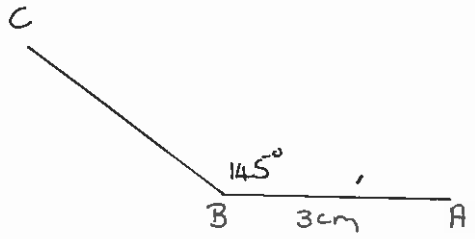


(2) Konstrueer die volgende:

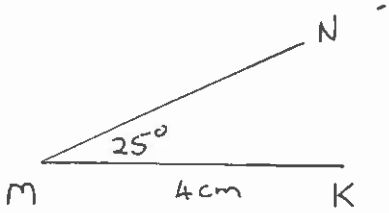
(a) $M\hat{N}T = 35°$ met $MN = 75$ mm



(b) $A\hat{B}C = 145°$ met $AB = 3$ cm

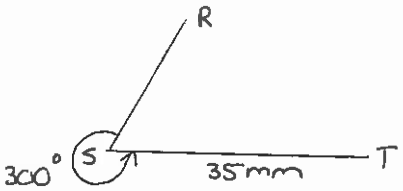


(c) $K\hat{M}N = 25°$ met $KM = 4$ cm

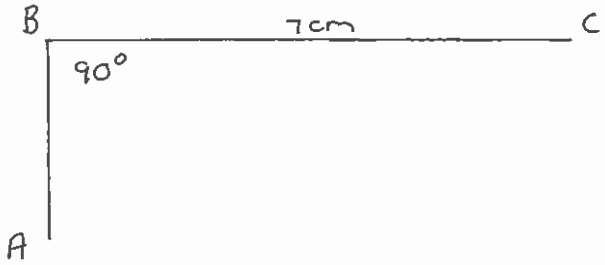


(d) $R\hat{S}T = 300°$ met $ST = 35$ mm

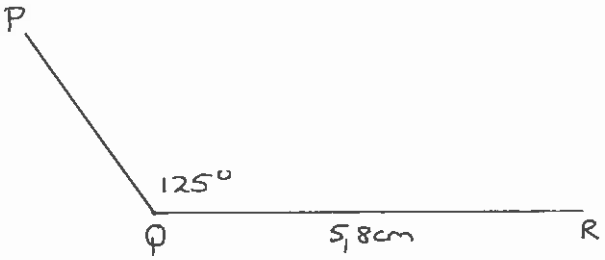
$360° - 60° = 300°$



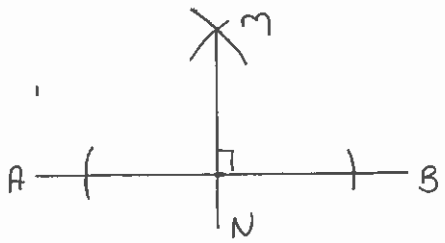
(e) $A\hat{B}C = 90°$ met $BC = 7$ cm



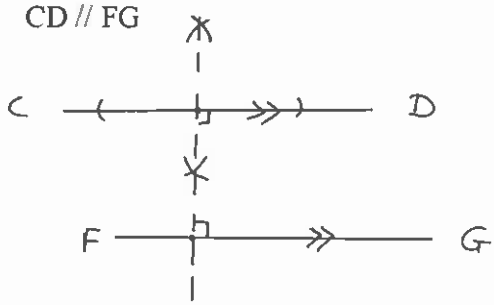
(f) $R\hat{Q}P = 125°$ met $RQ = 5{,}8$ cm



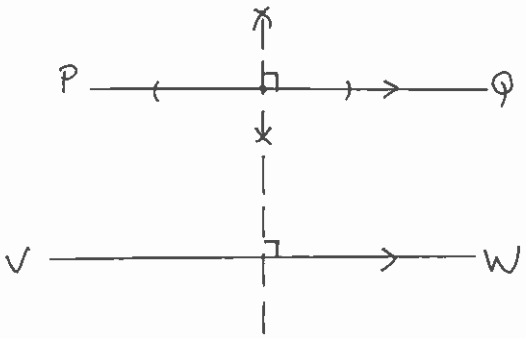
(g) $AB \perp MN$



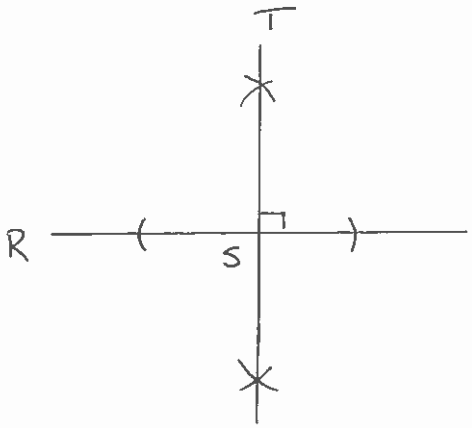
(h) $CD \parallel FG$



(i) $PQ \parallel VW$

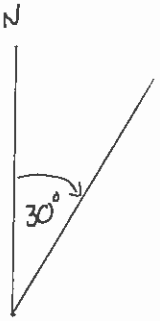


(j) $RS \perp ST$

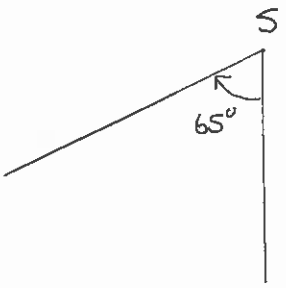


(3) Konstrueer die volgende:

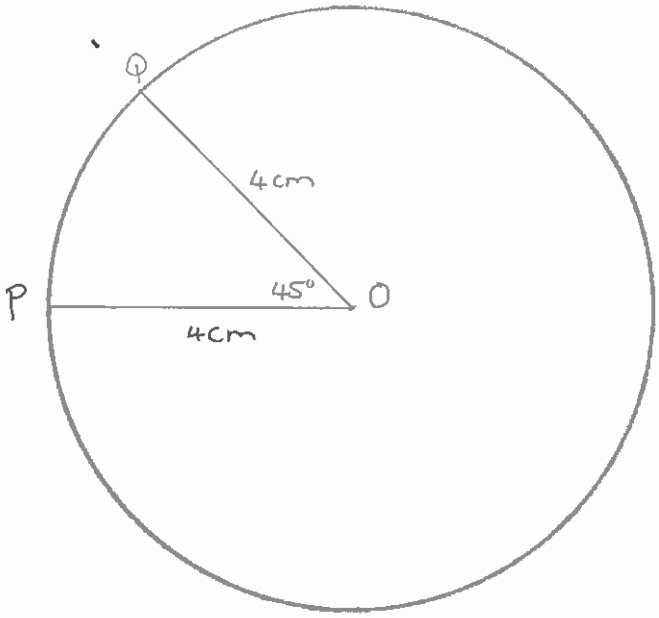
(a) `n hoek van 30° oos van noord



(b) `n hoek van 65° wes van suid



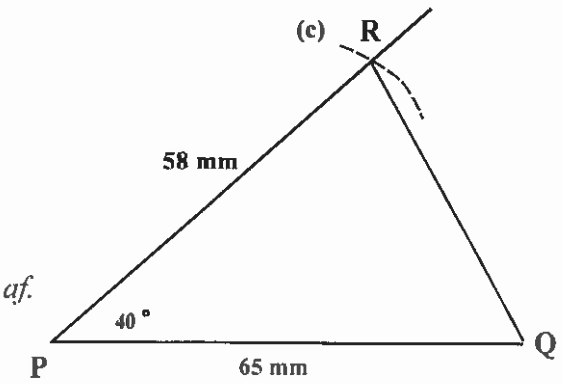
(4) (a) Konstrueer `n sirkel met radius 4 cm.
(b) Benoem die middelpunt O.
(c) Trek `n radius OP in.
(d) Konstrueer $P\hat{O}Q = 45°$, met OQ ook as `n radius.
(e) Meet die lengte van OQ.
(f) Wat let jy op van die lengte van OQ? OQ = OP ∴ radiusse ewe lank.



C1.2.2 Driehoeke:

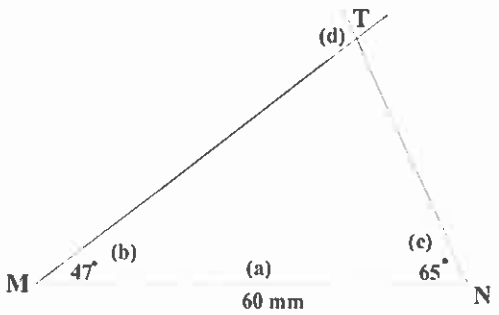
Vb.5 Konstrueer ΔPQR met: $PQ = 6{,}5$ cm ; $PR = 5{,}8$ cm en $\hat{P} = 40°$.

(a) Trek lyn PQ = 65 mm.
(b) Konstrueer $\hat{P} = 40°$ met die gradeboog.
(c) Gebruik `n passer en liniaal en merk 58 mm af. Met die passerpunt op P, merk 58 mm af op nuwe lyn.
(d) Waar (c) die nuwe lyn sny is punt R. Verbind RQ.



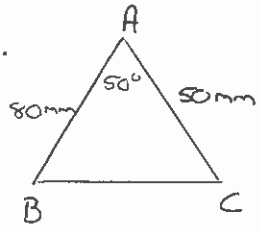
Vb.6 Konstrueer ΔMNT met: $\hat{M} = 47°$; $\hat{N} = 65°$ en $MN = 0{,}06$ m.

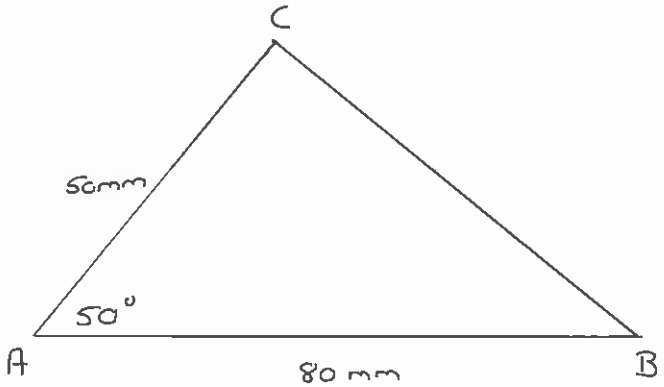
(a) Trek lyn $MN = 0{,}06\ m = 6\ cm = 60\ mm$.
(b) Konstrueer by M 'n 47° met gradeboog.
(c) Konstrueer by N 'n 65° met gradeboog.
(d) Waar (b) en (c) sny, is punt T.



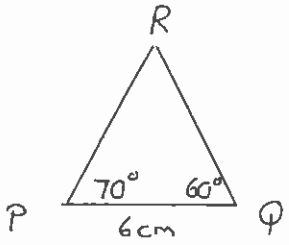
Oefening 3: Datum: _____

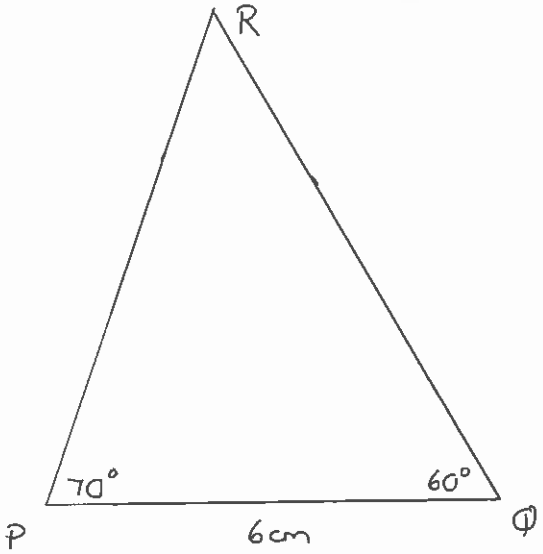
(1) (a) Konstrueer ΔABC met AB = 80 mm ; $\hat{A}$ = 50° en AC = 50 mm.



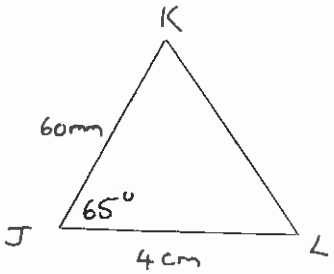


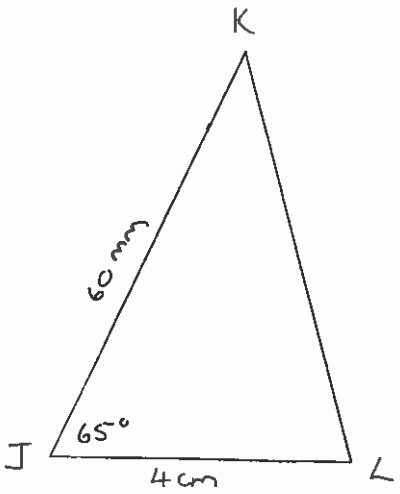
(b) Konstrueer ΔPQR met PQ = 6 cm ; $\hat{P}$ = 70° en $\hat{Q}$ = 60°.



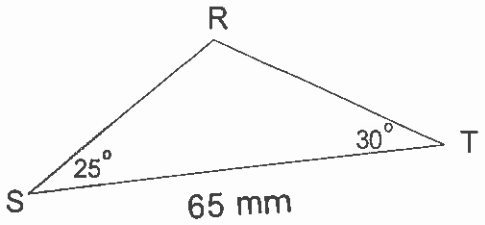


(c) Konstrueer ΔJKL met JK = 60 mm ; $\hat{J}$ = 65° en JL = 4 cm.





(2) Die driehoek langsaan is nie op skaal geteken nie, maar alle afmetings is aangedui. Konstrueer die driehoek op skaal deur van die gegewe afmetings gebruik te maak.

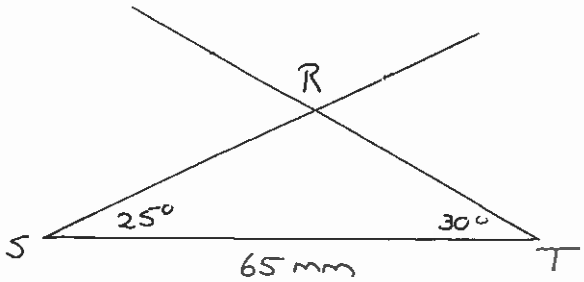


Meet: (a) $\hat{R}$ = 125°

(b) RS = 39 mm

(c) Bereken nou: $\hat{R} + \hat{S} + \hat{T}$. Wat kan jy aflei? $\hat{R}+\hat{S}+\hat{T}=180°$

Binne $\angle$ van 'n Δ is saam 180°



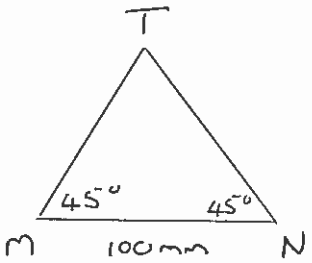
(3) (a) Konstrueer ΔMNT met $\hat{M} = 45°$; $\hat{N} = 45°$ en $MN = 100$ mm.

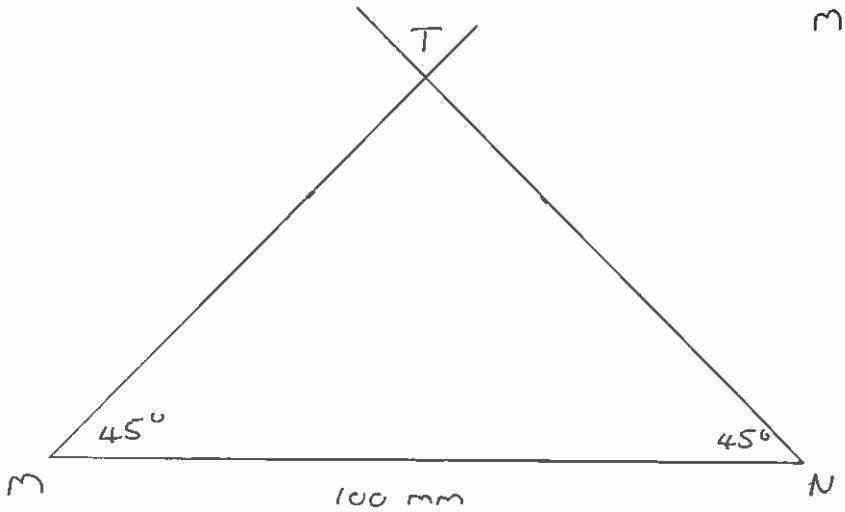
(b) Meet $\hat{T}$. 90°

(c) Meet MT en NT. MT = 71 mm en NT = 71 mm

(d) Wat kan jy afkei uit (b) en (c)?

Δ MNT is 'n gelykbenige, reghoekige Δ.





****

Hoofstuk C2

Meetkunde van 2-D vorms

C2.1 Lyne en hoeke:

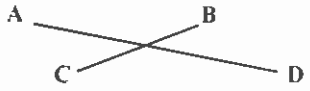
C2.1.1 Klassifikasie van lyne:

(1) Lyn: 'n Oneindige stel punte met geen definitiewe begin of eindpunt nie.

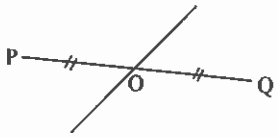
(2) Lynsegment: 'n Oneindige stel punte met 'n definitiewe begin en eindpunt.

(3) Straal: 'n Oneindige stel punte met 'n definitiewe beginpunt maar geen definitiewe eindpunt nie.

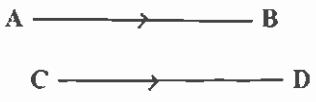
(4) Snylyne: Twee lyne wat mekaar sny.
∴ AD sny BC.



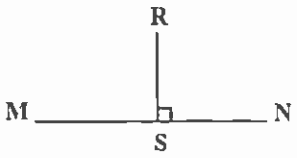
(5) Halveerlyne: Een lyn sny 'n ander lyn presies in die middel.
∴ PO = OQ.



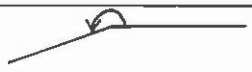
(6) Ewewydige lyne: Twee of meer lyne wat altyd ewe ver van mekaar af is. Die lyne sal dus nooit kruis nie. ∴ AB // CD.



(7) Loodregte lyne: 'n Lyn is loodreg op 'n ander lyn as dit 'n hoek van 90° maak met die lyn. ∴ RS ⊥ MN.



C2.1.2 Hoeke:

Tipe hoek:	Voorbeeld:	Hoekgrootte:
Skerphoek		Groter as 0° maar kleiner as 90°.
Regte hoek		Gelyk aan 90°.
Stomphoek		Groter as 90° maar kleiner as 180°.
Gestrekte hoek		Gelyk aan 180°.
Inspringende hoek		Groter as 180° maar kleiner as 360°.
Omwenteling		Gelyk aan 360°.