



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NASIENRIGLYN

NASIONALE SERTIFIKAAT

BOU- EN STRUKTUUROPMETING N6

4 APRIL 2018

Hierdie nasienriglyn bestaan uit 9 bladsye.

NASIENINSTRUKSIES

1. Gebruik 'n rooi pen om netjies na te sien.
 2. Moet NIE verkeerde antwoorde deurhaal nie.
 3. Skryf die punte vir elke antwoord in die regterkantlyn en die TOTAAL vir 'n hele vraag omkring in die linkerkantlyn neer.
 4. Gebruik u eie diskresie indien daar meer as een moontlik korrekte antwoord/formule/tekening is wat NIE op die nasienriglyn (memorandum) voorkom nie. Evalueer dit en ken punte dienooreenkomstig toe.
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VRAAG 1

NAAM	VERBIND	ΔY	ΔX	NAAM	Y	X
A				A	+ 1 932,96	+1 332,85
313:41:10		-140,18√	+133,90√			
193,85 m		-0,11√	+0,09√			
B				B	+1 792,67√	+1 466,84√
283:25:31		-251,44√	+60,04√			
258,51 m		-0,15√	+0,12√			
C				C	+1 541,08√	+1 527,00√
204:16:31		-73,83√	-163,70√			
179,58 m		-0,11√	+0,08√			
D				D	+1 467,14√	+1 363,38√
245:08:21		-279,64√	-129,57√			
308,20 m		-0,18√	+0,14√			
E				E	+1 187,32	+1 233,95
940,14√		-745,09√	-99,33√		-745,64√	-98,90√
		-745,64√	-98,90√			
		-0,55√	+0,43√			

$$\frac{-0,55}{940,14} \quad X \quad \checkmark \quad \frac{+0,43}{940,14} \quad X \quad \text{been}\checkmark$$

$$\begin{aligned} 1 \times 7 &= 7 \\ 0,5 \times 26 &= \frac{13}{20} \end{aligned}$$

[20]

VRAAG 2

Stasie	Linkersirkel	Regtersirkel	Gemiddelde hoek	Regstelling	Gewysigde hoek
B1	300:42:16	120:41:32			
B2	71:43:04	25:42:24			
	131:00:48	131:00:52	131:00:50	-00:00:02	131:00:48√
B2	71:43:04	251:42:24			
B3	169:39:22	349:38:52			
	97:56:18	97:56:28	97:56:23	-00:00:02	97:56:21√
B3	169:39:22	349:38:52			
B1	300:42:04	120:41:56			
	131:02:42	131:03:04	131:02:53	-00:00:02	131:02:51√
			360:00:06	-00:00:06	360:00:00√

VERBIND T1-B2

$$Dy_{T1-B2} = -2\,991,62 - (-2\,562,56) \\ = -429,09\sqrt{}$$

$$Dy_{T1-B1} = +3\,012,34 - 3\,862,12 \\ = -849,78\sqrt{}$$

$$\text{Rigting T1-B2} = \frac{-429,06}{-849,78} \text{ 3de kwadrant} \\ \text{Tan}\theta = 0,50490715\sqrt{}$$

Rigting T1-B2 206:47:22

Hoek B2; T1; B2 97:56:21√
T1-B3 304:43:43

Hoek B3; T1; B1 131:02:51√
T1 - B1 75:46:34

Hoek B1; T1; B2 131:00:48
T1-B2 206:47:22√

[10]

VRAAG 3

Stasie		Afstand		HI of middelhaar MH	Hoeke		HI-MH + -	Hoogtekomponent + -	Hoogteverskil + -	Hoogte van punt	Opmerkings
Van	Na	Stadia	Hor		Hor	Vert					
R				1,46						713,24	
	R1	1,90 0,58	129,05√	1,24√	136:49:00	98:36:00	+0,22√	-19,30√	-19,30√	693,94√	
	R2	4,02 2,60	139,01√	3,31√	173:21:00	81:39:00	-1,85√	+20,40√	+18,55√	731,79√	
	R3	1,84 0,60	121,69√	1,22√	246:32:00	82:09:00	+0,24√	+16,78√	+17,02√	730,26√	
	R4	3,64 1,26	228,38√	2,45√	299:52:00	101:36:00	-0,99√	-46,88√	-47,87√	665,37√	

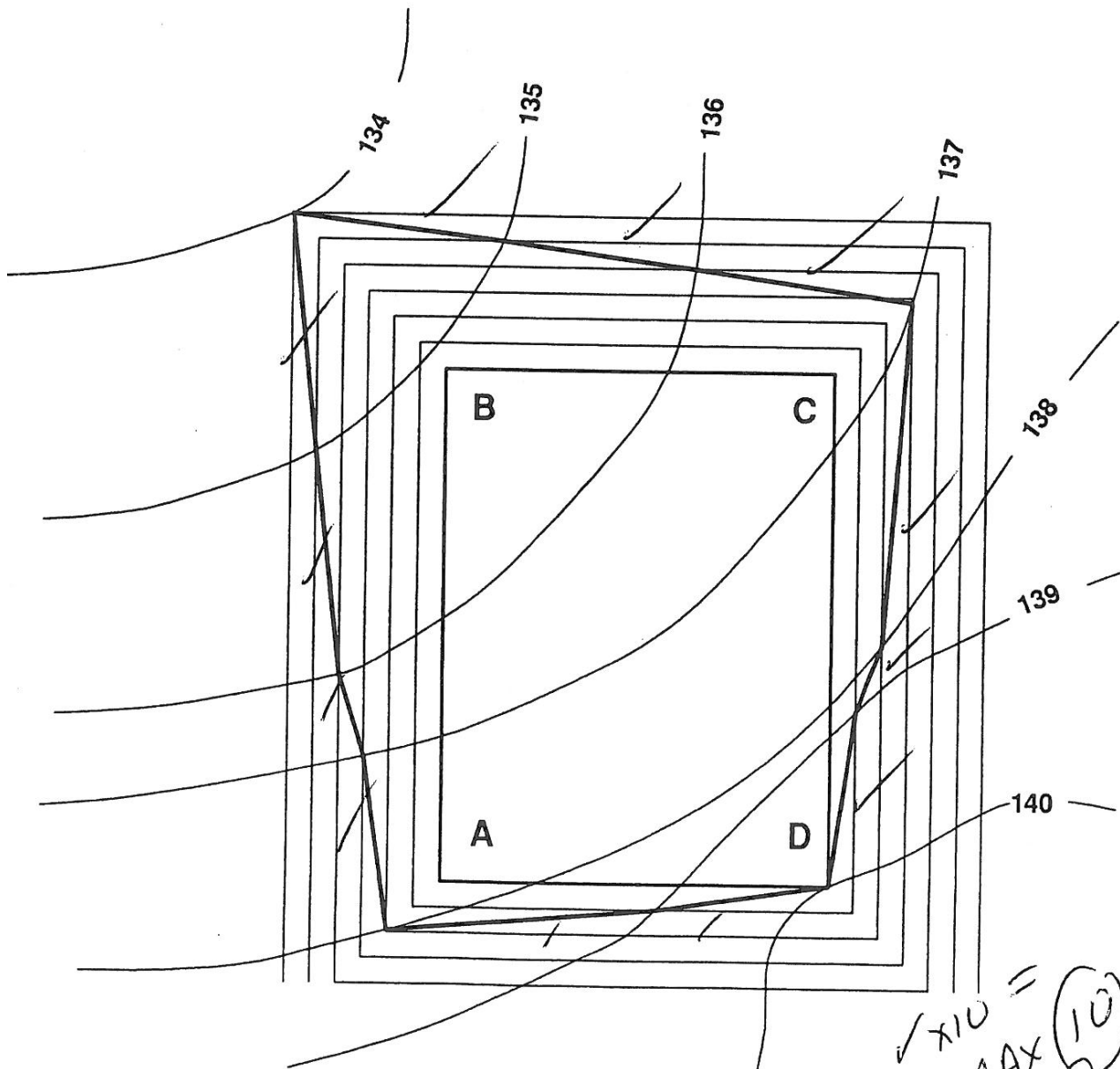
$$1 \times 16 = 16$$

$$0,5 \times 8 = \underline{04}$$

$$= 20$$

[20]

VRAAG 4



SKAAL VAN 1 : 500

[10]

VRAAG 5

$$\begin{aligned} \text{Afstand S1-S2} &= 3\,122,24 - 2\,932,82 \\ &= 189,42 \text{ m} \end{aligned}$$

Oppervlakte S1

$$\begin{aligned} W_1 &= \frac{g(a+hs)}{g-s} \\ &= \frac{6(4,5+(2,68 \times 2,5))}{6-2,5} \sqrt{} \\ &= \underline{19,2} \sqrt{} \end{aligned}$$

$$\begin{aligned} W_2 &= \frac{g(a+hs)}{g-s} \\ &= \frac{67,2}{8,5} \sqrt{} \\ &= \underline{7,9} \sqrt{} \end{aligned}$$

$$\begin{aligned} \text{Oppervlakte} &= \frac{(w_1 \times w_2) - a^2}{s} \\ &= \frac{(19,2 \times 7,9) - (4,5)^2}{2,5} \sqrt{} \\ &= \underline{52,57 \text{ m}^2} \sqrt{} \end{aligned}$$

Oppervlakte S1

$$\begin{aligned} W_1 &= \frac{g(a+hs)}{g-s} \\ &= \frac{8(4,5+(1,76 \times 2,5))}{8-2,5} \sqrt{} \\ &= \underline{12,95} \sqrt{} \end{aligned}$$

$$\begin{aligned} W_2 &= \frac{g(a+hs)}{g-s} \\ &= \frac{71,2}{10,5} \sqrt{} \\ &= \underline{6,78} \sqrt{} \end{aligned}$$

$$\begin{aligned} \text{Oppervlakte} &= \frac{(W_1 \times W_2) - a^2}{s} \\ &= \frac{(12,95 \times 6,78) - (4,5)^2}{2,5} \sqrt{} \\ &= \underline{27,02 \text{ m}^2} \sqrt{} \end{aligned}$$

$$\begin{aligned} \text{Volume} &= \frac{A_1 + A_2}{2} \times \text{afstand} \\ &= \frac{(52,57 + 27,02)}{2} \times 108,42 \sqrt{} \\ &= 7\,537,96 \text{ m}^3 \sqrt{} \end{aligned}$$

[15]

VRAAG 6

$$T = R \tan \frac{\Delta}{2} \sqrt{}$$

$$T = 210 \times \tan 21:00:00 \sqrt{}$$

$$T = 80,61 \text{ m} \sqrt{}$$

$$\begin{aligned} BC &= 4\,348,21 - 80,61 \sqrt{} \\ &= 4\,267,6 \text{ m} \sqrt{} \end{aligned}$$

$$\begin{aligned} La &= \frac{\pi \Delta R}{180} \\ &= \frac{\pi \times 42:00:00 \times 210 \sqrt{}}{180} \\ &= 153,93 \text{ m} \sqrt{} \end{aligned}$$

$$\begin{aligned} EC &= BC + La \\ &= 4\,267,6 + 153,93 \sqrt{} \end{aligned}$$

$$EC = 4\,421,53 \text{ m} \sqrt{}$$

$$(a = 12,4) = \frac{1\,718,9 \times 12,4}{210 \times 60} = 01:41:29,82 \sqrt{}$$

$$(a = 20,00) = \frac{1\,718,9 \times 20,00}{210 \times 60} = 02:43:42 \sqrt{}$$

$$(a = 1,53) = \frac{1\,718,9 \times 1,53}{210 \times 60} = 00:12:31 \sqrt{}$$

KETTINGMETING	KOORD	β	α
BC 4267,60		00:00:00	360:00:00 $\sqrt{}$
4280,00	12,40	01:41:30	358:18:30 $\sqrt{}$
4300,00	20,00	02:43:42	355:34:48 $\sqrt{}$
4320,00	20,00	02:43:42	352:51:06 $\sqrt{}$
4340,00	20,00	02:43:42	350:07:24 $\sqrt{}$
4360,00	20,00	02:43:42	347:23:42 $\sqrt{}$
4380,00	20,00	02:43:42	344:40:00 $\sqrt{}$
4400,00	20,00	02:43:42	341:56:18 $\sqrt{}$
4420,00	20,00	02:43:42	339:12:36 $\sqrt{}$
EC 4421,53	1,53	00:12:31	339:00:05 $\sqrt{}$
153,93 $\sqrt{}$	153,93 $\sqrt{}$	20:59:55 $\sqrt{}$	20:59:55 $\sqrt{}$

$$0,5 \times 12 = 6$$

$$1 \times 14 = \underline{14}$$

$$\underline{20}$$

[20]

VRAAG 7

- 7.1 Die rigtingshoek is die hoek wat in 'n kloksgewyse rigting tussen nulrigting (suid) en die betrokke lyn meet. (3)
- 7.2 'n Geslote roetepeiling is wanneer daar van 'n bekende punt na 'n ander bekende punt of na dieselfde vertrekpunt gewerk word. (2)
- [5]**
- TOTAAL: 100**