

**SENIOR CERTIFICATE
EXAMINATION
SENIORSERTIFIKAAT-EKSAMEN**



**OCTOBER / NOVEMBER
OKTOBER / NOVEMBER**

2004

TECHNICAL DRAWING

TEGNIESE TEKENE

**(First Paper: Descriptive
Geometry and Locus)
(Eerste Vraestel: Beskrywende
Meetkunde en lokus)**

HG 711-1/1

**7 pages
7 bladsye**

TECHNICAL DRAWING HG: Paper 1



711 1 1

HG

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**GAUTENG
DEPARTMENT OF EDUCATION**

SENIOR CERTIFICATE EXAMINATION

TECHNICAL DRAWING HG 711-1/1 V

(First Paper : Descriptive Geometry and Locus)

TIME : 3 hours

MARKS : 200

**GAUTENGSE
DEPARTEMENT VAN ONDERWYS**

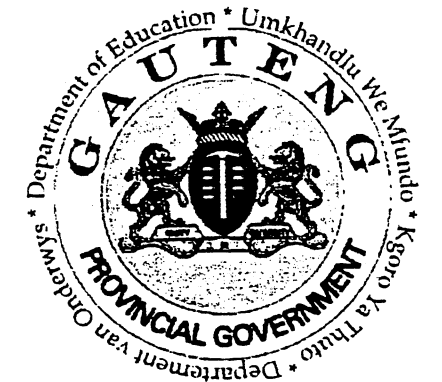
SENIORSERTIFIKAAT - EKSAMEN

TEGNIESE TEKENE HG 711-1/1 V

(Eerste Vraestel : Beskrywende Meetkunde en Lokus)

TYD : 3 uur

PUNTE : 200



INSTRUCTIONS :

1. Answer all questions on the answer sheets provided.
2. Any dimensions or details not given may be assumed.
3. Hand in all your answer sheets (whether the question has been attempted or not) in correct **numerical** sequence, **stapled** in the top left-hand corner.
4. Write your examination number on all answer sheets.
5. If not otherwise stated, use a scale of 1:1 for all answers.
6. NOTE : HP = Horizontal Plane
VP = Vertical Plane
7. Align the answer sheets on centre lines/ground lines and not the frame.
8. **All** questions are compulsory.
9. The use of coloured lead will be penalised.

INSTRUKSIES :

1. Beantwoord al die vrae op die gegewe antwoordblaaie.
2. Enige afmetings of besonderhede wat ontbreek, kan afgelei word.
3. Handig al jou antwoordblaaie (ongegag of die vraag beantwoord is of nie) in korrekte **numeriese** volgorde in, **vasgekram** in die boonste linkerkantse hoek.
4. Skryf jou eksamennommer op alle antwoordblaaie.
5. Tensy anders vermeld, gebruik 'n skaal van 1:1 vir alle antwoorde.
6. LET WEL : HV = Horisontale Vlak
VV = Vertikale Vlak
7. Rig die antwoordblaaie op senterlyne/grondlyne en nie die raam nie.
8. **Alle** vrae is verpligtend.
9. Die gebruik van gekleurde lood sal gepeenaliseer word.

Page 1 of 8
P.T.O. .../Question 1

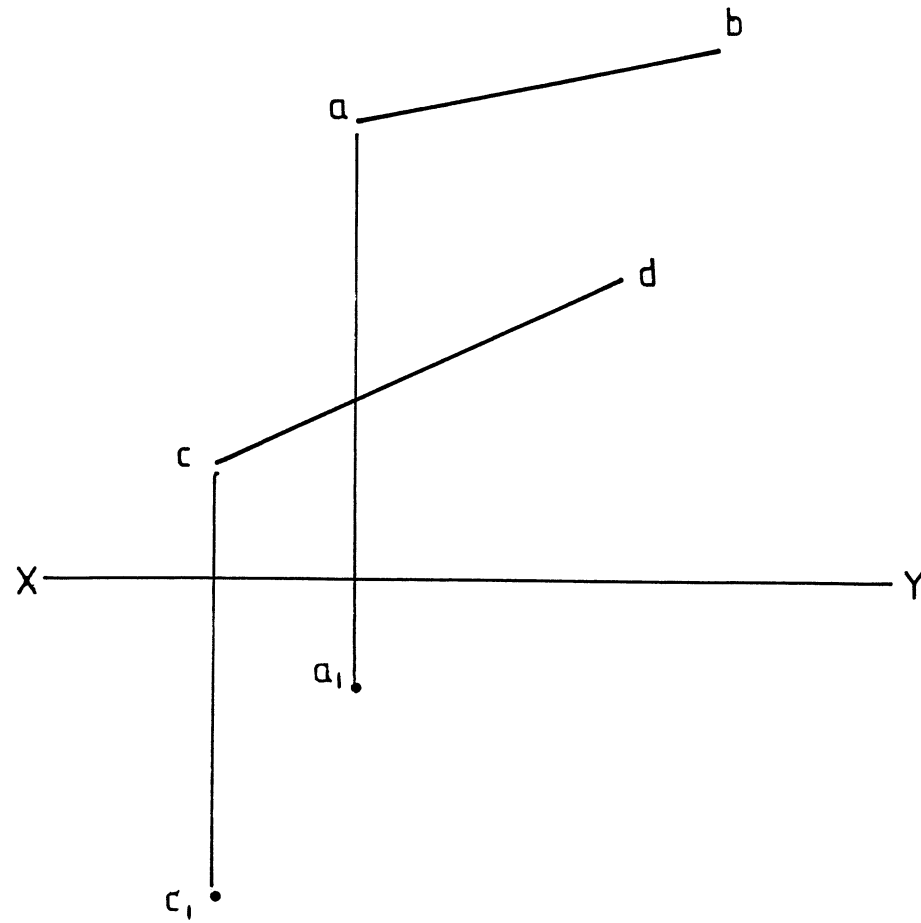
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EXAMINATION NUMBER
EKSAMENNOMMER

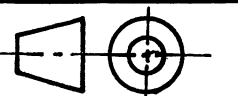
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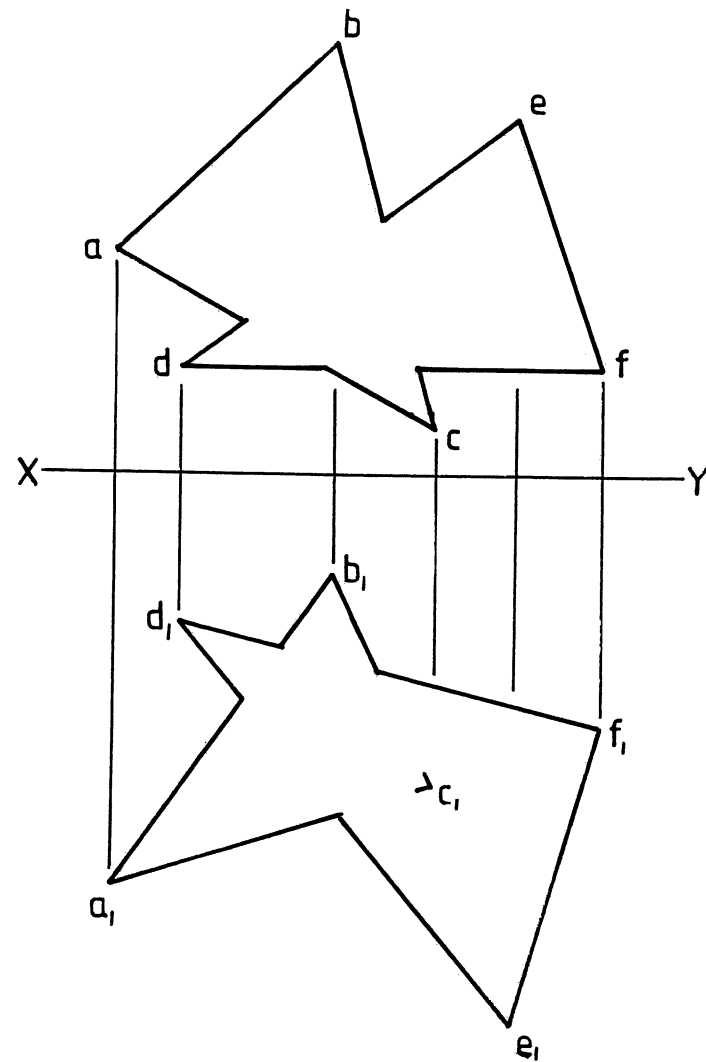
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SLEGS VIR AMPTELIKE GEBRUIK

QUESTION VRAAG	MARKS PUNTE	MODERATED MODERATOR	MAXIMUM MAKSIMUM
1			25
2			40
3			40
4			40
5			25
6			30
TOTAL TOTAAL			200
CHECKED BY GEKONTRO- LEER DEUR			%



QUESTION 1		MARKS PUNTE
The front view of two line segments AB and CD and the top view of only points A and C are given. The geographical bearing of line segment AB is S56°E and line segment CD is N78°E. Determine the following by means of construction :		
1.1 The top view of line segments AB and CD	4	
1.2 The true length of line segment CD	3	
1.3 The angle of inclination between line segment CD and the HP	1	
1.4 The shortest distance between line segments AB and CD	8	
1.5 Show the shortest distance in all the views.	6	
PRESENTATION		3
TABULATE YOUR ANSWERS NEATLY.		25
<p style="text-align: center;">VRAAG 1</p> Die vooraansig van lynstuk AB en CD asook die boaansig van punt A en C word gegee. Die geografiese ligging van lynstuk AB is S56°O en lynstuk CD is N78°O. Bepaal die volgende d.m.v. konstruksie :		
1.1 Die boaansig van lynstuk AB en CD	4	
1.2 Die ware lengte van lynstuk CD	3	
1.3 Die ware helling van lynstuk CD t.o.v. HV	1	
1.4 Die kortste afstand tussen lynstuk AB en CD	8	
1.5 Toon die kortste afstand in alle aansigte.	6	
AANBIEDING		3
BEANTWOORD NETJIES IN TABELVORM.		25





QUESTION 2

The front view and top view of plane figures ABC and DEF are given.
 Determine :

- 2.1 The true angle of inclination between plane figure DEF and the HP
- 2.2 Line of interpenetration between plane figures ABC and DEF in the front view and top view. Complete the views by drawing in all hidden detail.
- 2.3 All vertical traces (VT) and horizontal traces (HT) of the plane figure ABC.

PRESENTATION

7
 20
 9
 4
40

VRAAG 2

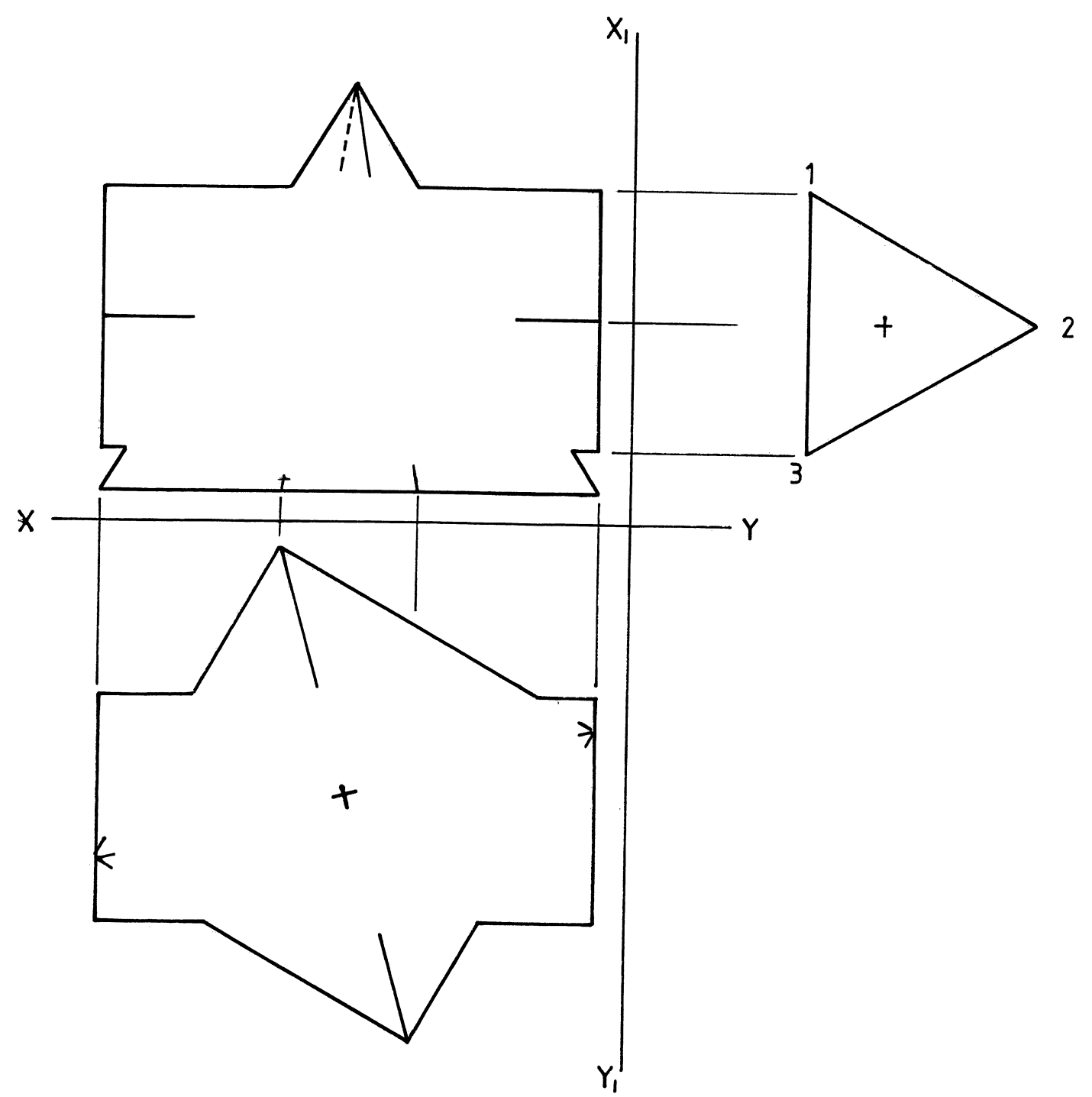
Die vooraansig en boaansig van vlakfigure ABC en DEF word getoon.
 Bepaal :

- 2.1 Die ware helling van vlakfiguur DEF ten opsigte van die HV
- 2.2 Deurdringingslyn tussen vlakfiguur ABC en DEF in die vooraansig en boaansig. Voltooi die aansigte deur alle verborge detail aan te toon.
- 2.3 Alle vertikale snyspore (VS) en horisontale snyspore (HS) van vlakfiguur ABC.

AANBIEDING

7
 20
 9
 4
40





QUESTION 3

The incomplete front view and incomplete top view of a regular triangular prism that has been shaped to fit over a regular square pyramid, are shown.

Complete the following views of both solids :

- 3.1 The left view 5
- 3.2 The complete top view showing the lines of interpenetration and hidden detail 15
- 3.3 The complete front view showing the lines of interpenetration and hidden detail 16

PRESENTATION 4

40

VRAAG 3

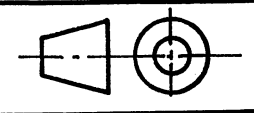
Die onvoltooide vooraansig en onvoltooide boaansig van 'n reëlmatige driehoekige prisma wat so gevorm is om oor 'n reëlmatige vierkantige piramide te pas, word getoon.

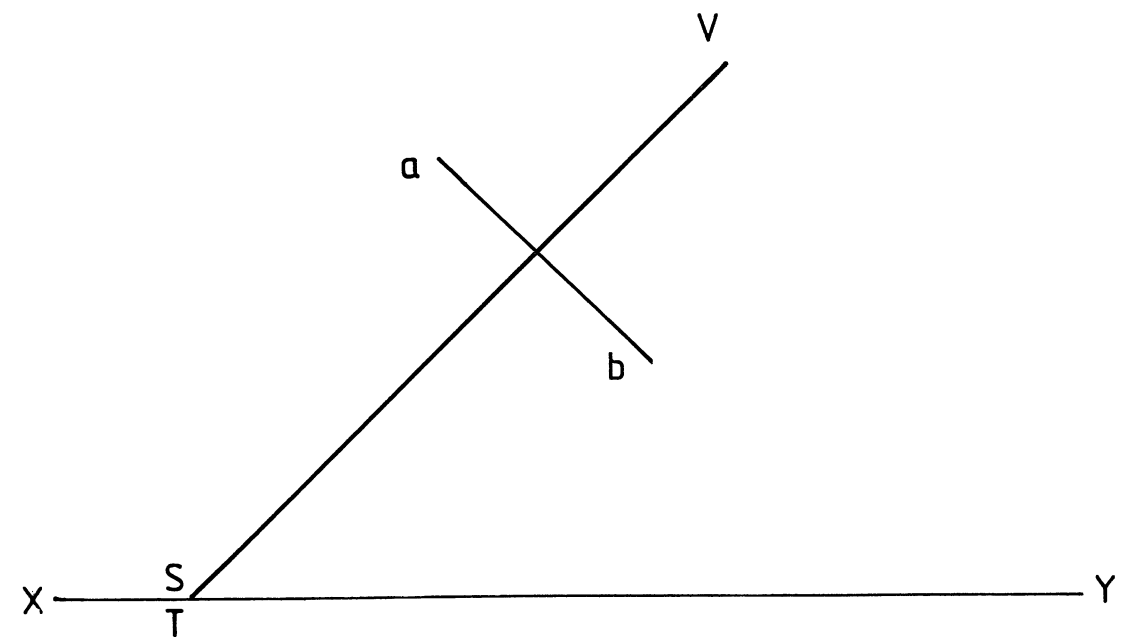
Voltooi die volgende ten aansigte van beide vaste liggame :

- 3.1 Die linkeraansig 5
- 3.2 Die voltooide boaansig en toon die deurdringingskromme en verborge detail 15
- 3.3 Die voltooide vooraansig en toon die deurdringingskromme en verborge detail 16

AANBIEDING 4

40





QUESTION 4

The vertical trace (VT) of an oblique plane VTH is given. Line segment AB represents the axis of a hexagonal prism in the front view. This hexagon, with base sides 25 mm, is positioned with its base on the oblique plane with one side of the base parallel to the VP.

Determine the following if the true angle of inclination between the oblique plane and the VP = 52°.

- 4.1 The front view of the prism 22
- 4.2 The top view of the prism 12
- 4.3 The horizontal trace of the oblique plane VTH 2

Show all hidden detail.

PRESENTATION	4
	40

VRAAG 4

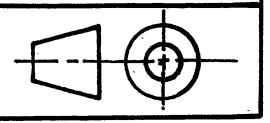
Die vertikale snyspoor (VS) van 'n skuinsvlak VSH word getoon. Lynstuk AB stel die as van 'n seshoekige prisma in die vooraansig voor. Hierdie seshoek, met basissye 25 mm, word met die basis op die skuinsvlak geplaas en een sy van die basis parallel aan die VV.

Bepaal die volgende indien die ware helling tussen die skuinsvlak en die VV = 52°.

- 4.1 Die vooraansig van die prisma 22
- 4.2 Die boaansig van die prisma 12
- 4.3 Die horisontale snyspoor van die skuinsvlak VSH 2

Toon alle verborge detail.

AANBIEDING	4
	40



QUESTION 5

A special cam profile is machined into a circular disk with a diameter of 160 mm (FIGURE 5.2).

The disk cam transmits the following reciprocating motion at constant velocity to a roller-ended cam follower:

- A drop of 20 mm for the first 90° of cam rotation
- Dwell for the next 60° of cam rotation
- A drop of one quarter of the total displacement over the next 75° of cam rotation
- A drop to the minimum displacement for the next 45°
- A rise of 40 mm until maximum displacement for the last 90° of cam rotation

The cam moves in an anti-clockwise direction and the cam follower moves horizontally in the same plane as the cam shaft. The cam has an axis of 20 mm diameter and the minimum cam radius of 20 mm.

Draw the displacement diagram and construct the cam profile. Use 100 mm to represent 360° of cam rotation. The starting position of the cam follower is given in FIGURE 5.1.

PRESENTATION

22

3

25

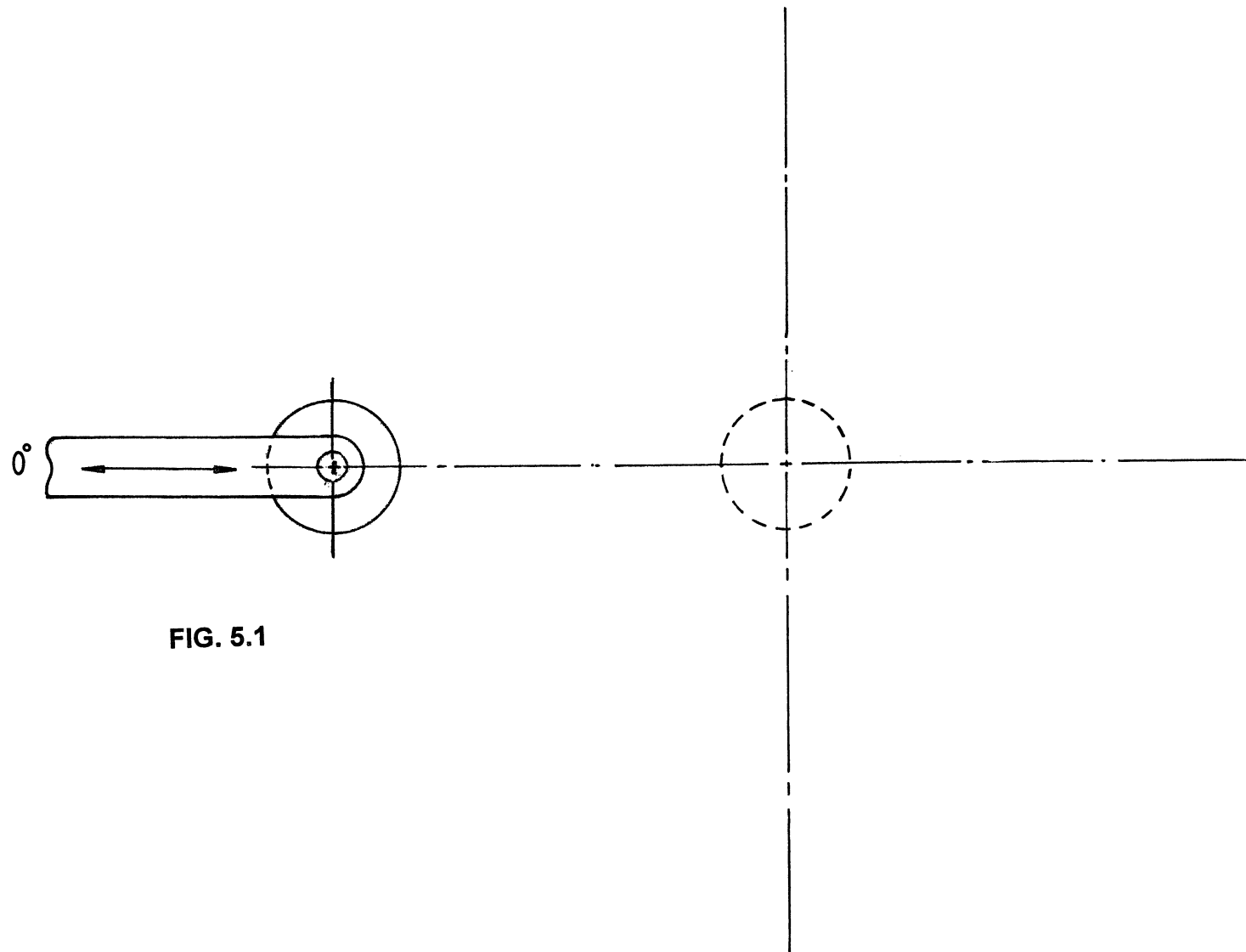


FIG. 5.1

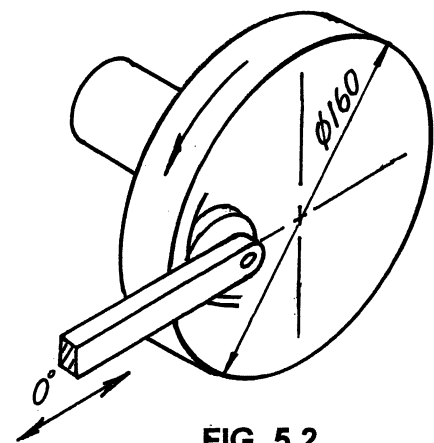


FIG. 5.2

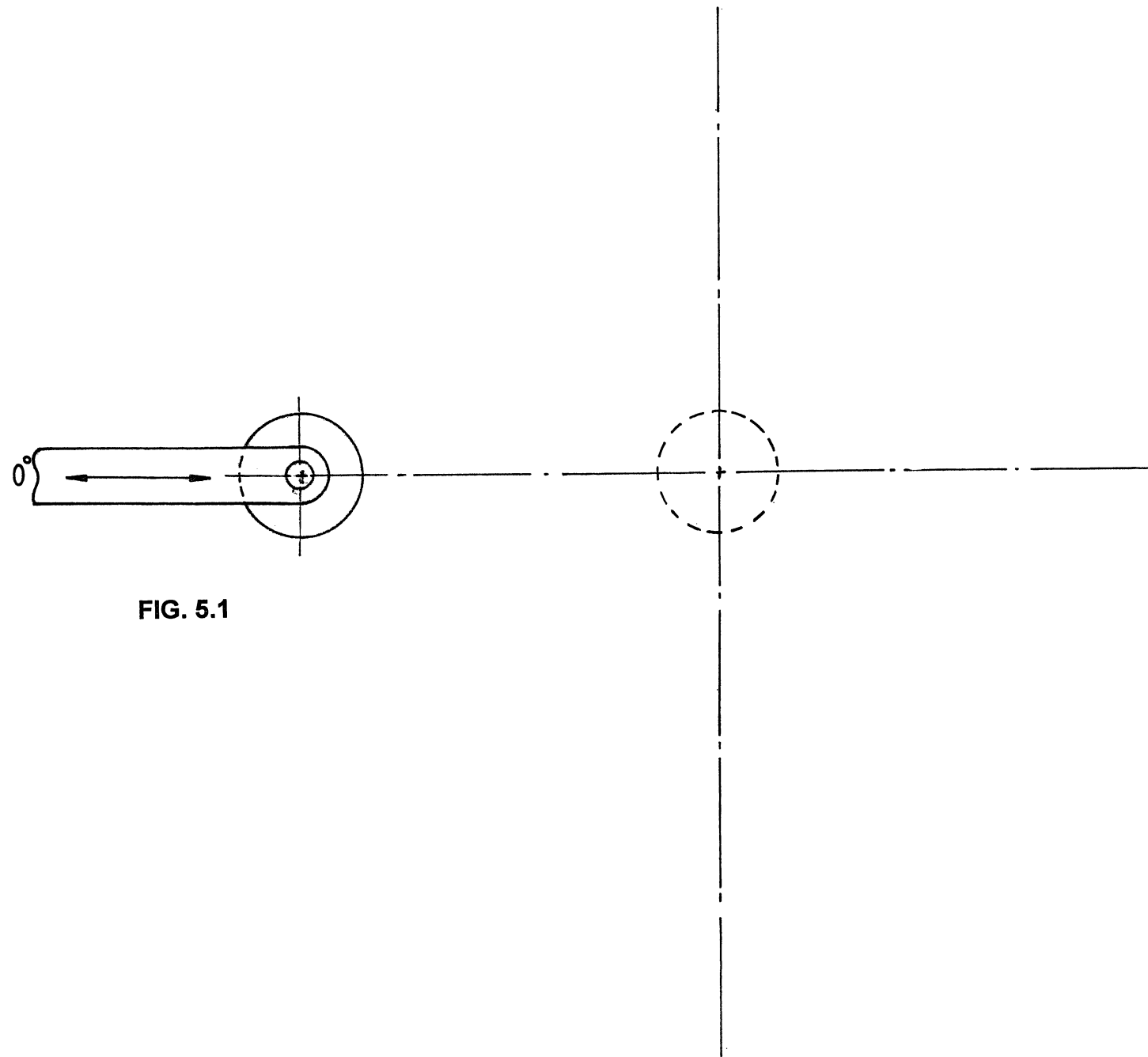


FIG. 5.1

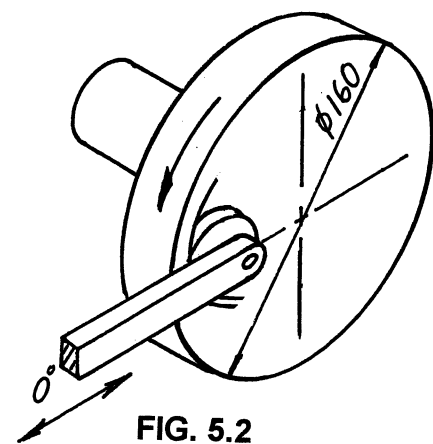


FIG. 5.2

VRAAG 5

'n Spesiale nokprofiel word in 'n ronde skyf met 'n diameter van 160 mm gemasjineer (FIGUUR 5.2).

Die skyfnok beweeg teen konstante snelheid en dra die volgende wederkerige beweging aan die rollervolger oor :

- 'n Daling van 20 mm vir die eerste 90° nokrotasie
- Rus vir die volgende 60° van nokrotasie
- 'n Daling van een kwart van die totale verplasing vir die volgende 75° van nokrotasie
- Daal tot by minimum verplasing vir die volgende 45°
- 'n Styging van 40 mm tot by die maksimum verplasing vir die laaste 90° van nokrotasie

Die nok beweeg antiklokgewys en die nokvolger beweeg in dieselfde horisontale vlak as die nokas. Die nokas het 'n diameter van 20 mm en die minimum nokradius is 20 mm.

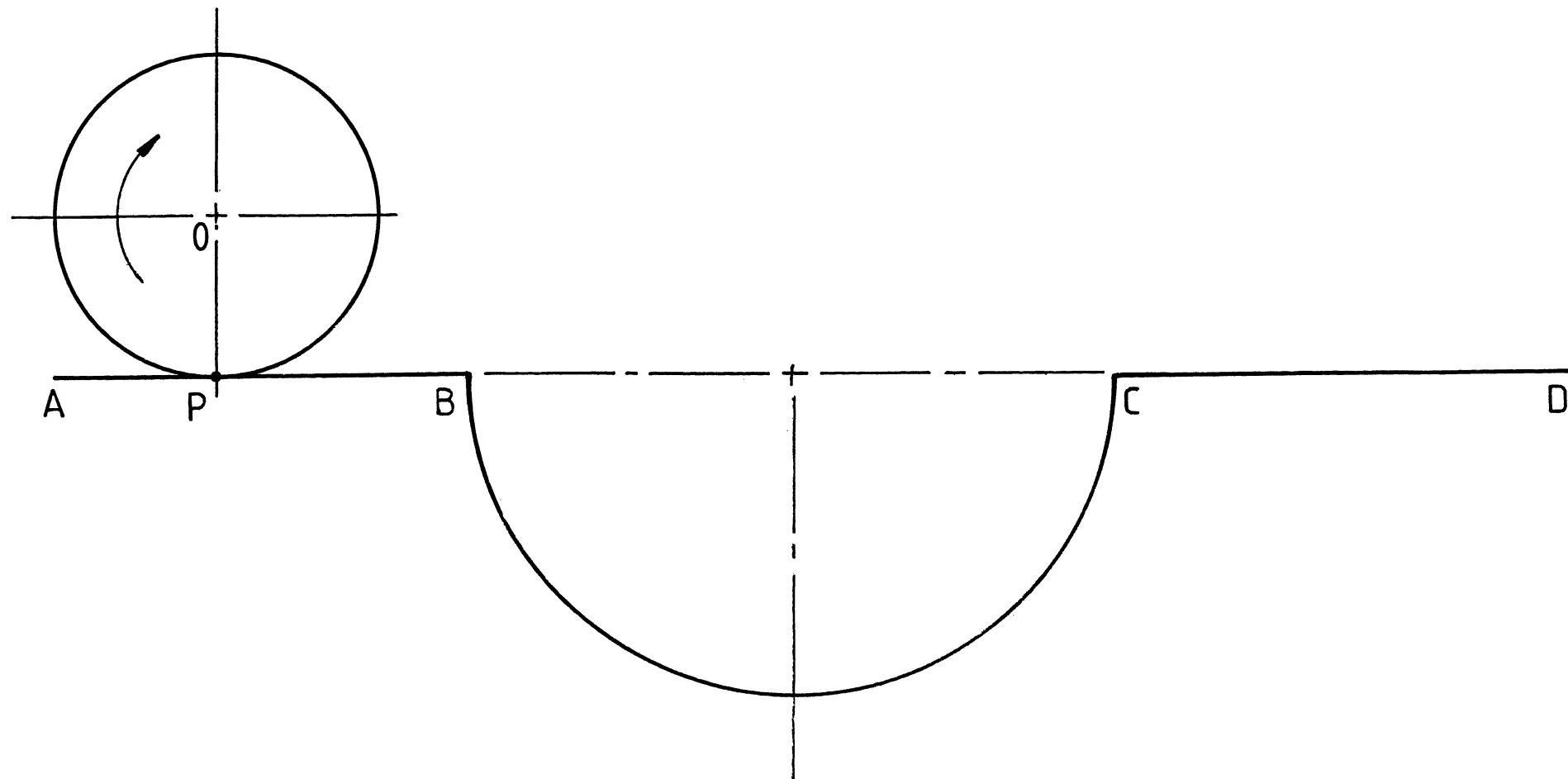
Teken die verplasingsdiagram en konstrueer die nokprofiel. Gebruik 100 mm om 360° van nokrotasie voor te stel
 Die aanvangsposisie van die nokvolger word in FIGUUR 5.1 getoon.

AANBIEDING

22

3

25



QUESTION 6

A disc O which rolls without slipping along the contour ABCD is shown.

6.1 Determine the loci for point P if the disc rolls for one and a half revolutions. 19

6.2 Name the loci generated by point P. 8

Show all calculations.

PRESENTATION 3

30

VRAAG 6

'n Ronde skyf O rol sonder om te gly oor die kontoer ABCD soos aangetoon.

6.1 Bepaal die lokus vir punt P indien die skyf een en 'n halwe omwenteling voltooi. 19

6.2 Benoem die lokus/se wat deur punt P gevorm word. 8

Toon alle berekeninge.

AANBIEDING 3

30