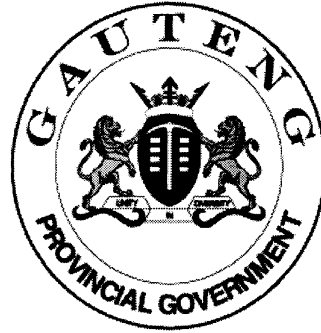


**SENIOR CERTIFICATE
EXAMINATION
*SENIORSERTIFIKAAT-EKSAMEN***



**FEBRUARY / MARCH
*FEBRUARIE / MAART***

2007

**TECHNICAL DRAWING
*TEGNIесе TEKENE***

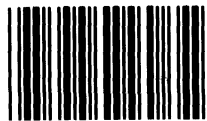
**First Paper: Descriptive Geometry and
Locus**

***Eerste Vraestel : Beskrywende
Meetkunde en Lokus***

HG

711-1/1

X05



**TECHNICAL DRAWING/TEGNIесе TEKENE HG
Paper 1/Vraestel 1**



711 1 1

HG

**Cover + 9 pages
*Voorblad + 9 bladsye***

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**GAUTENG
DEPARTMENT OF EDUCATION**

SENIOR CERTIFICATE EXAMINATION

TECHNICAL DRAWING HG 711-1/1 Z

(First Paper : Descriptive Geometry and Locus)

TIME : 3 hours

MARKS : 200

**GAUTENGSE
DEPARTEMENT VAN ONDERWYS**

SENIORSERTIFIKAAT-EKSAMEN

TEGNIESE TEKENE HG 711-1/1 Z

(Eerste Vraestel : Beskrywende Meetkunde en Locus)

TYD : 3 uur

PUNTE : 200



INSTRUCTIONS:

1. **All** questions are compulsory.
2. Answer all questions on the answer sheets provided.
3. Any dimensions or details not given may be assumed.
4. 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.
5. Write your examination number on all answer sheets.
6. If not otherwise stated, use a scale of 1:1 for all answers.
7. **NOTE :** HP = Horizontal Plane VP = Vertical Plane
 HT = Horizontal Trace VT = Vertical Trace
8. Align the answer sheets on centre lines/ground lines and not the frame.
9. The use of coloured lead will be penalised.

INSTRUKSIES:

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

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SLEGS VIR AMPTELIKE GEBRUIK

QUESTION VRAAG	MARKS PUNTE	MODERATED MODERATOR	MAXIMUM MAKSIMUM
1			35
2			30
3			35
4			30
5			20
6			30
7			10
PRESENTATION / AANBIEDING			10
TOTAL TOTAAL			200
CHECKED BY / GEKONTRO- LEER DEUR			%

EXAMINATION NUMBER
EKSAMENNOMMER

8	0	6									
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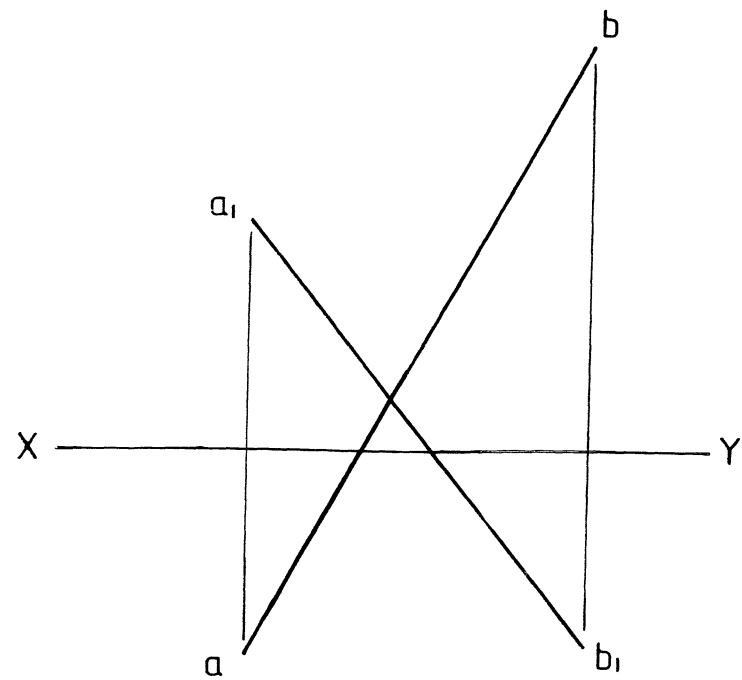


FIG. 1.1

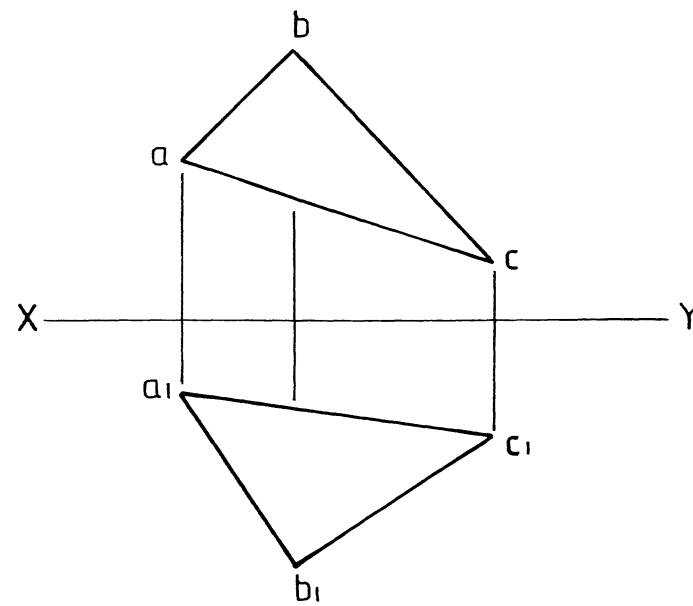


FIG. 1.2

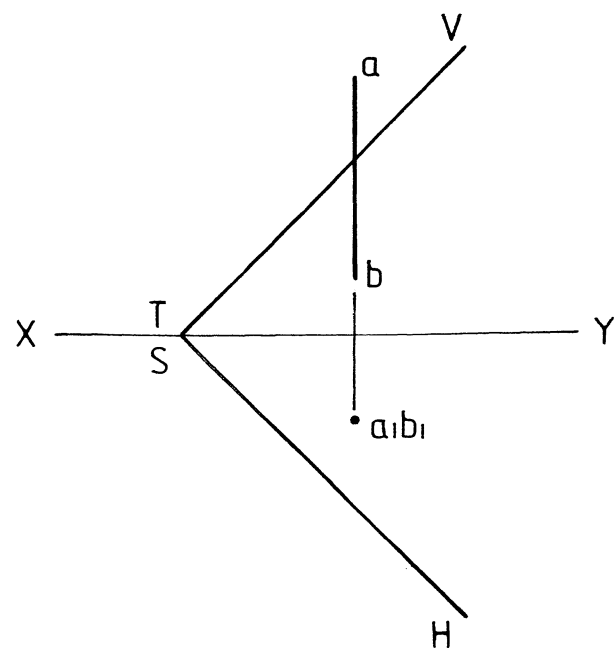


FIG. 1.3

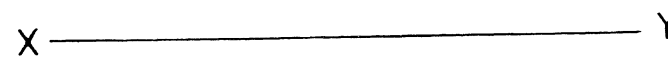
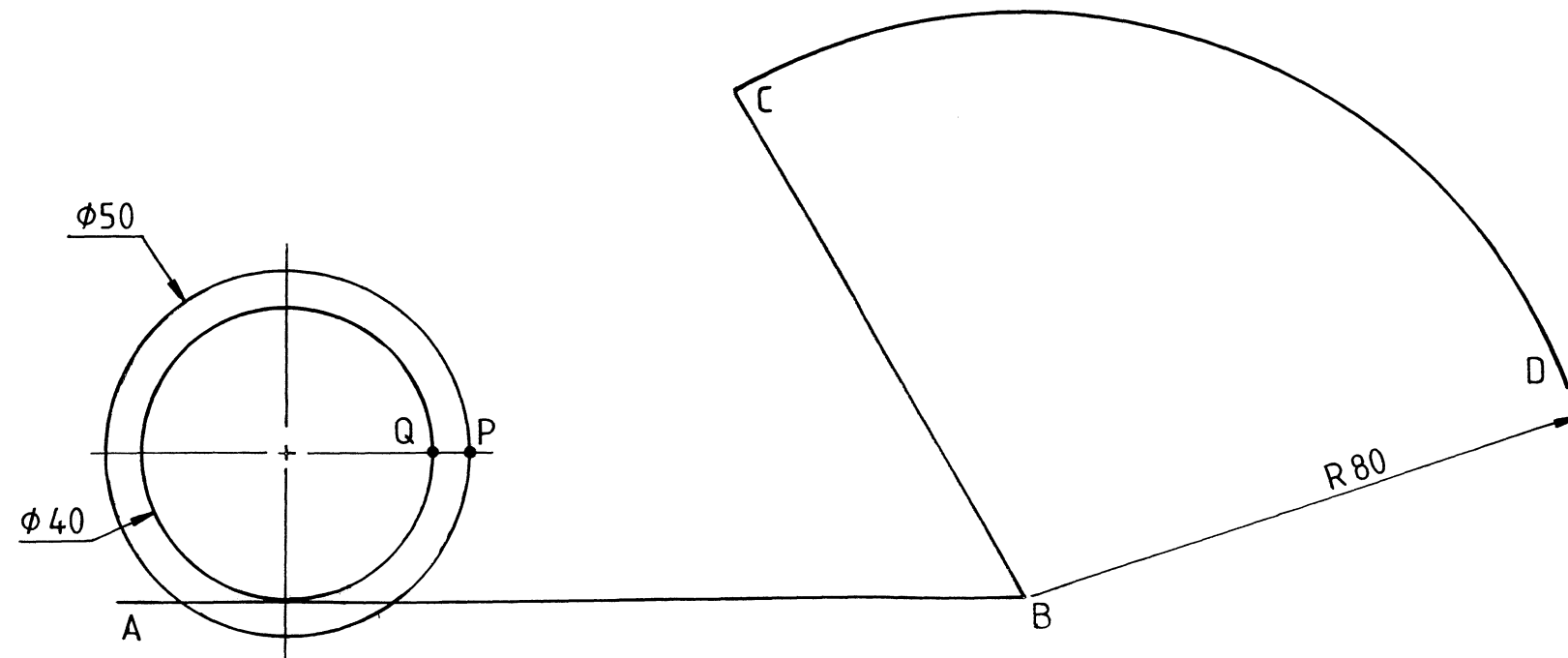


FIG. 1.4

QUESTION 1		MARKS
1.1	Determine and indicate the VT and HT of line segment AB shown in FIG 1.1 .	4
1.2	In FIG 1.2 find the	
1.2.1	true angle between plane figure ABC and the HP .	6
1.2.2	true shape and size of plane figure ABC .	6
1.3	Determine the cutting trace between line segment AB and the oblique plane shown in FIG 1.3 .	7
1.4	A line segment AB with true length of 70 mm is inclined to the HP and VP at 30° and 45° respectively. Point A lies in the HP and 12 mm in front of the VP . Complete the front view and the top view of line segment AB .	12
		35

VRAAG 1		PUNTE
1.1	Bepaal en toon die VS en HS aan van lynstuk AB aangetoon in FIG. 1.1 .	4
1.2	In FIG 1.2 bepaal die	
1.2.1	ware hoek tussen vlakfiguur ABC en die HV .	6
1.2.2	ware vorm en grootte van vlakfiguur ABC .	6
1.3	Bepaal die snyspoor tussen lynstuk AB en die skuinsvlak soos getoon in FIG 1.3 .	7
1.4	'n Lynstuk AB met ware lengte van 70 mm lê skuins t.o.v. beide die HV en VV teen 30° en 45° respektiewelik. Punt A lê in die HV en 12 mm voor die VV . Voltooi die vooraansig en die boaansig van lynstuk AB .	12
		35



QUESTION 2

Shown is the contour **ABCD** on which point **P** and **Q** on the cylindrical disc, must complete $1\frac{1}{4}$ revolutions, point **P** on the straight surface and point **Q** on the curved surface.
 Plot the curves and name the loci generated.
 Show all calculations.

26
4

30

VRAAG 2

Getoon is die kontoer **ABCD** waarop die ronde skyf met punte **P** en **Q** $1\frac{1}{4}$ omwentelinge moet voltooi, punt **P** op die reguit oppervlak en punt **Q** oor die geboë oppervlak.
 Teken die kromme en benoem die lokusse wat gegeneer word.
 Toon alle berekeninge.

26
4

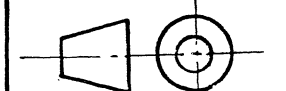
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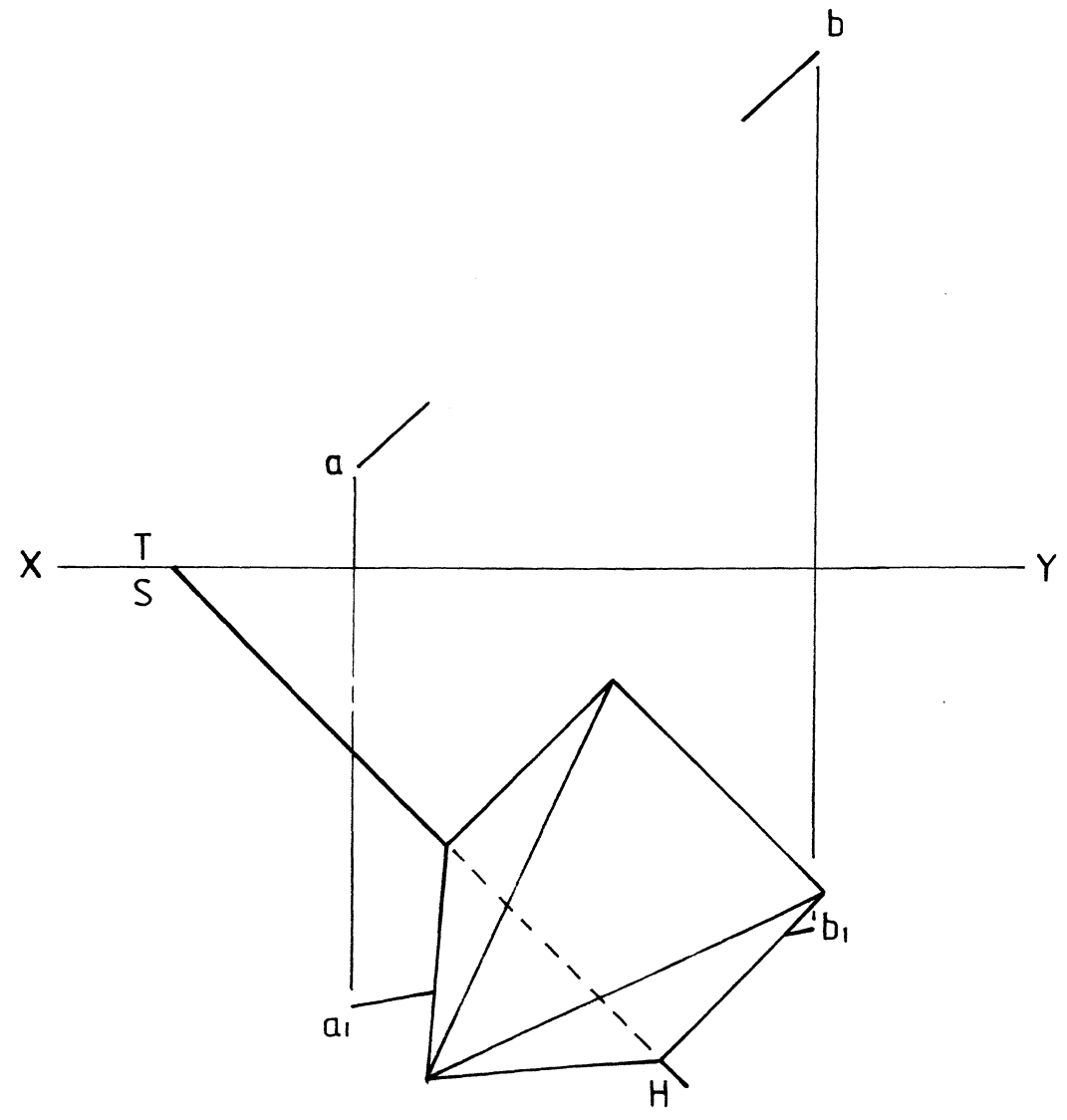
Calculations / Berekeninge

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Name / Benoem

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QUESTION 3

MARKS

The top view of a square pyramid with its base lying on the oblique plane is given. The **HT** of the oblique plane is shown as well as the front view and top view of line segment **AB**.

Draw

- 3.1 in the auxiliary view the pyramid with its base on top of the oblique plane if the angle between the oblique plane and the **HP** = 38°.
- 3.2 the **VT** of the oblique plane.
- 3.3 the front view of the pyramid showing the traces (points of intersection) between the line segment **AB** and the pyramid. Also show the traces of the line segment in the top view.
- 3.4 Measure and show the true height of the pyramid on your drawing. Show all hidden detail.

11
3
18
3

35

PUNTE

VRAAG 3

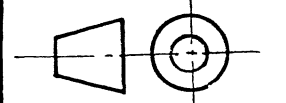
Die boansig van 'n vierkantige piramide met sy basis wat op die skuinsvlak rus, word getoon. Die **HS** van die skuinsvlak asook die vooraansig en boansig van lynstuk **AB** word getoon.

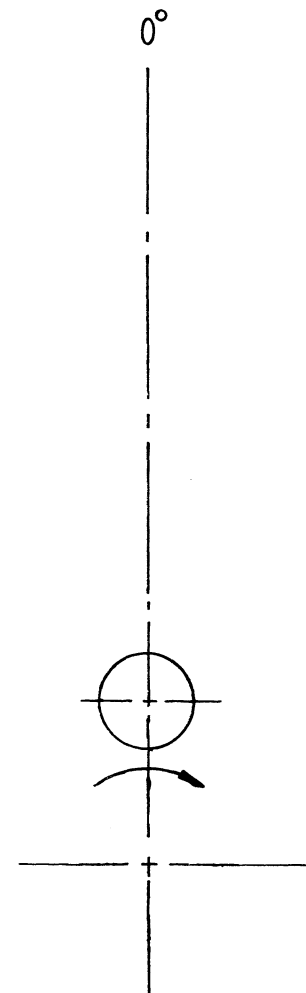
Teken

- 3.1 in die hulpaansig die piramide met sy basis op die skuinsvlak indien die hoek tussen die skuinsvlak en die **HV** = 38° is.
- 3.2 die **VS** van die skuinsvlak.
- 3.3 die vooraansig van die piramide wat die snyspore (deurdringingspunte) tussen die lynstuk **AB** en die piramide toon. Toon die snyspore van die lynstuk ook in die boansig.
- 3.4 Meet en toon die ware hoogte van die piramide op jou tekening. Toon alle verborge detail.

11
3
18
3

35





QUESTION 4

Shown are the camshaft centre, direction of rotation and initial position of a roller-ended follower of a disc cam.

MARKS

4.1 Draw the profile and displacement graph of the disc cam which transmits reciprocating motion to a roller-ended follower given that:

- Diameter of roller = 12 mm
- Diameter of camshaft = 20 mm
- Minimum distance from cam shaft centre to the bottom of the roller = 15 mm

Cam follower specifications:

- Rises 26 mm for the first 60° rotation
- Rests for the next 45° rotation
- Rises a further 30 mm for the next 45° rotation
- Rests for the next 30° rotation
- Rises a further 15 mm for the next 60° rotation
- Returns to its original position for the last 120° rotation

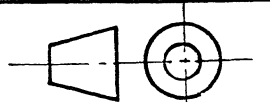
The horizontal scale of the graph is to be 120 mm = 360° rotation.

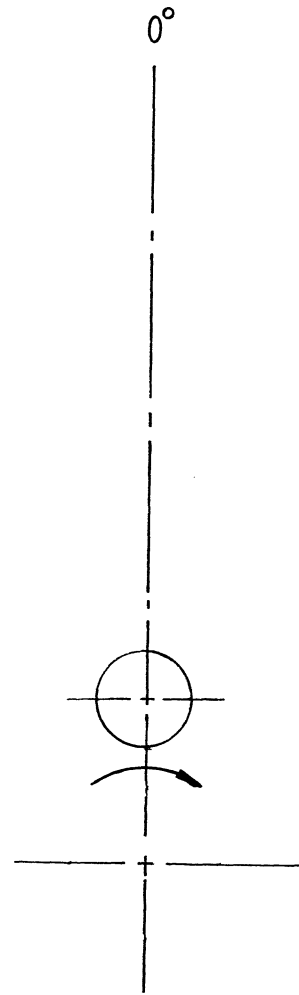
26

4.2 Determine:

- 4.2.1 Total travel of the follower 1
- 4.2.2 Displacement of follower after 180° rotation 1
- 4.2.3 Travel of the follower after the cam has rotated 300° 1
- 4.2.4 Angular displacement of the cam when the follower has travelled 40 mm 1

30





VRAAG 4

Die nokas-middelpunt van 'n skyfnok, rigting van rotasie asook beginposisie van 'n roller-nokvolger word getoon.

PUNTE

4.1 Teken die profiel en verplatingsgrafiek van die skyfnok wat wederkerige beweging aan 'n rollervolger oordra gegewe die volgende:

- Roller diameter = 12 mm
- Nokas diameter = 20 mm
- Minimum afstand van die nokas-middelpunt na die onderpunt van die roller = 15 mm

Nokvolger-spesifikasies:

- Styg 26 mm vir die eerste 60° rotasie
- Verkeer in rus vir die volgende 45° rotasie
- Styg 'n verdere 30 mm vir die volgende 45° rotasie
- Verkeer in rus vir die volgende 30° rotasie
- Styg 'n verdere 15 mm vir die volgende 60° rotasie
- Keer terug na die oorspronklike posisie oor die laaste 120° rotasie

Die horisontale skaal van die verplatingsgrafiek moet 120 mm = 360° wees.

4.2 Bepaal:

- 4.2.1 Die totale slag van die volger 1
- 4.2.2 Verplasing van die volger na 180° nokas-rotasie 1
- 4.2.3 Slag van die volger na 300° nokas-rotasie 1
- 4.2.4 Hoekverplasing van die nok indien die volger 40 mm beweeg het 1

26

1

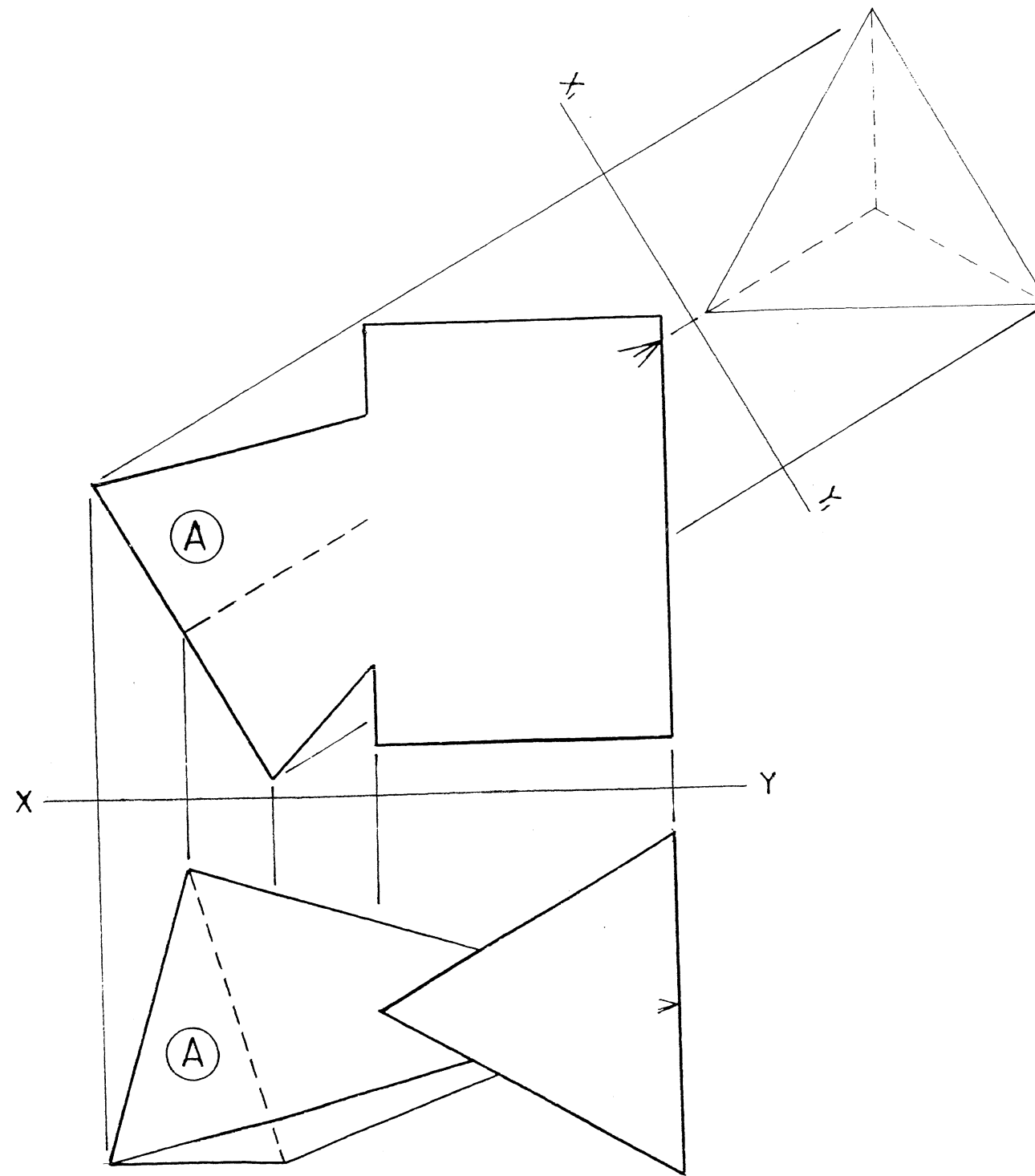
1

1

1

30





QUESTION 5

The incomplete front view and top view of a triangular prism penetrated by a triangular pyramid is shown.

MARKS

Determine :

- 5.1 The curve of interpenetration in the front view. Show visibility. 10
- 5.2 The development (surface pattern) of the pyramid A. Let the seam be at the shortest edge of the development. 10

20

VRAAG 5

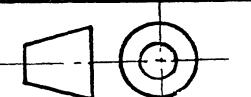
Die onvoltooide vooraansig en boaansig van 'n driehoekige prisma wat deurgedring word deur 'n driehoekige piramide word getoon.

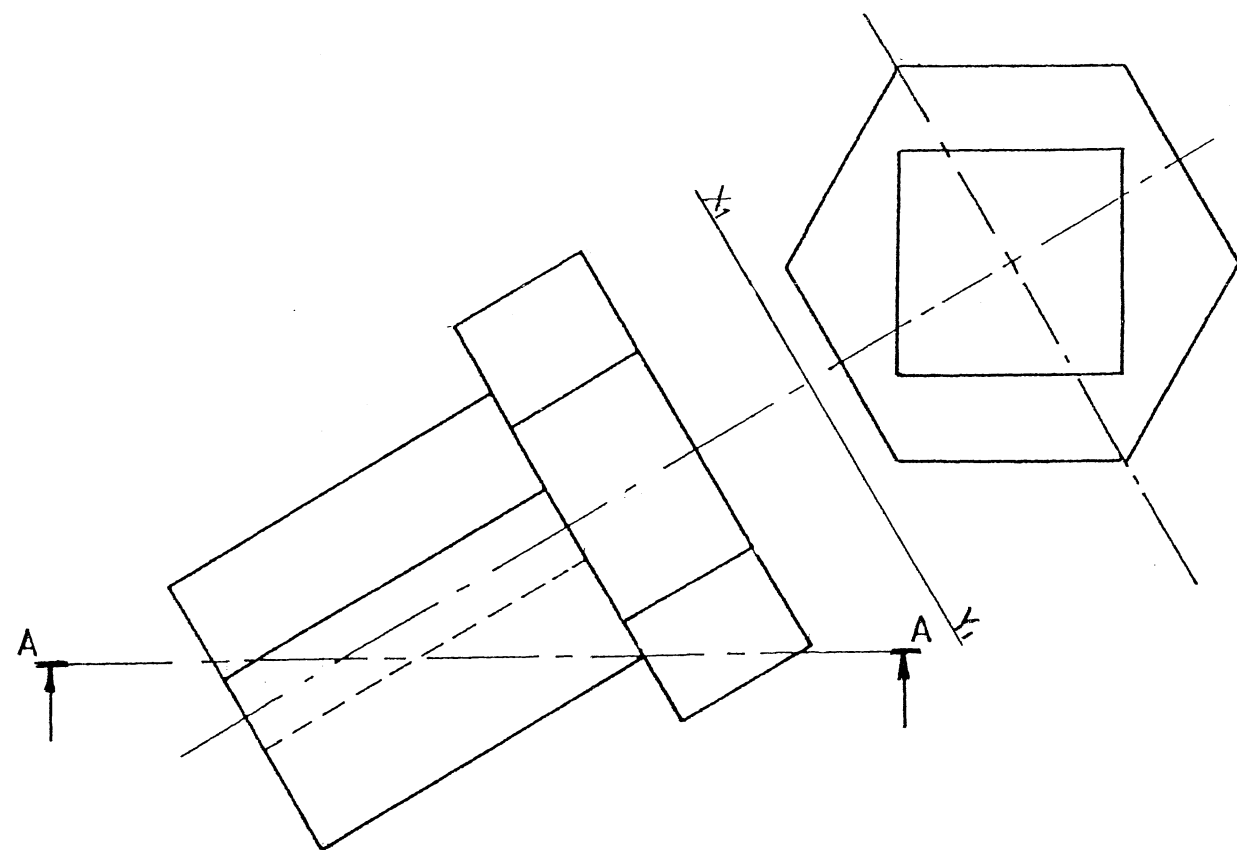
PUNTE

Bepaal:

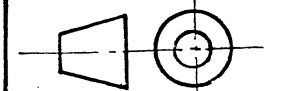
- 5.1 Die deurdringingskromme in die vooraansig. Toon sigbaarheid aan. 10
- 5.2 Die oppervlakontwikkeling (oppervlakpatroon) van die piramide A. Laat die las(soom) aan die kortste kant van die ontwikkeling wees. 10

20





QUESTION 6		MARKS	
The top view and auxiliary view of a casting is given. The casting consists of a hexagonal prism and a square prism.			
Determine:			
6.1	A sectional front view on cutting plane A-A. No hidden detail is required.	17	
6.2	Left view showing all hidden detail.	13	
		30	
VRAAG 6		PUNTE	
Die boansig en hulpaansig van 'n gietstuk word getoon. Die gietstuk bestaan uit 'n seshoekige prisma en 'n vierkantige prisma.			
Bepaal:			
6.1	'n Deursnee vooraansig op snyvlak A-A. Geen verborge detail hoef getoon te word nie.	17	
6.2	'n Linkeraansig wat alle verborge detail toon.	13	
		30	



QUESTION 7

A round disc and square are shown. A piece of string of negligible thickness, attached at P, is wrapped around the objects in an anti-clockwise direction ending at P.

MARKS

7.1 Construct the path generated by P as it unwinds in the direction indicated and ends on the vertical line. Show all constructions.

9

7.2 Name the locus generated.

1

10

VRAAG 7

'n Ronde skyf en vierkant word getoon. 'n Stukkie tou van weglaatbare dikte, geheg by P, word om die voorwerpe gerol in 'n anti-klokgewyse rigting en eindig dan by P.

PUNTE

7.1 Konstrueer die baan van P indien die tou afgerol word in die rigting aangetoon en eindig teen die vertikale lyn. Toon alle konstruksies.

9

7.2 Benoem die lokus gevorm.

1

10

