

GAUTENG  
DEPARTMENT OF EDUCATION

SENIOR CERTIFICATE EXAMINATION

TECHNICAL DRAWING HG 711-1/1 U

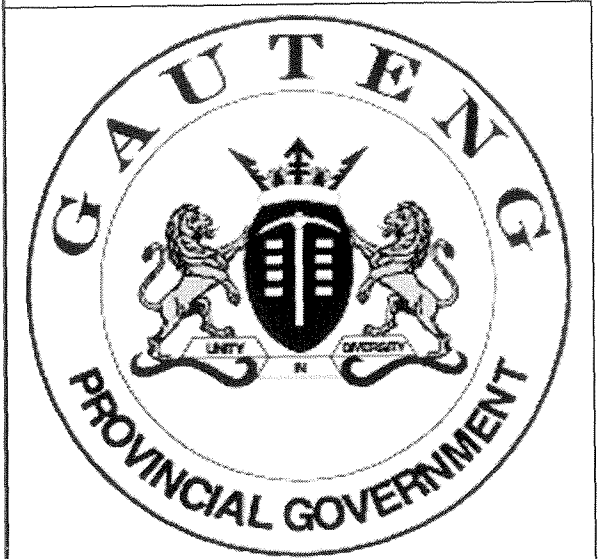
(First Paper : Descriptive Geometry and Locus)

GAUTENGSE  
DEPARTEMENT VAN ONDERWYS

SENIORSERTIFIKAAT-EKSAMEN

TEGNIESE TEKENE HG 711-1/1 U

(Eerste Vraestel : Beskrywende Meetkunde en Lokus)



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SLEGS VIR AMPTELIKE GEBRUIK

QUESTION VRAAG	MARKS PUNTE	MODERATED MODERATOR	MAXIMUM MAKSIMUM
1			30
2			25
3			20
4			30
5			30
6			30
7			25
PRESENTATION / AANBIEDING			10
<b>TOTAL TOTAAL</b>			<b>200</b>
CHECKED BY / GEKONTROLEER DEUR			%

EXAMINATION NUMBER  
EKSAMENNOMMER

8	0	6							
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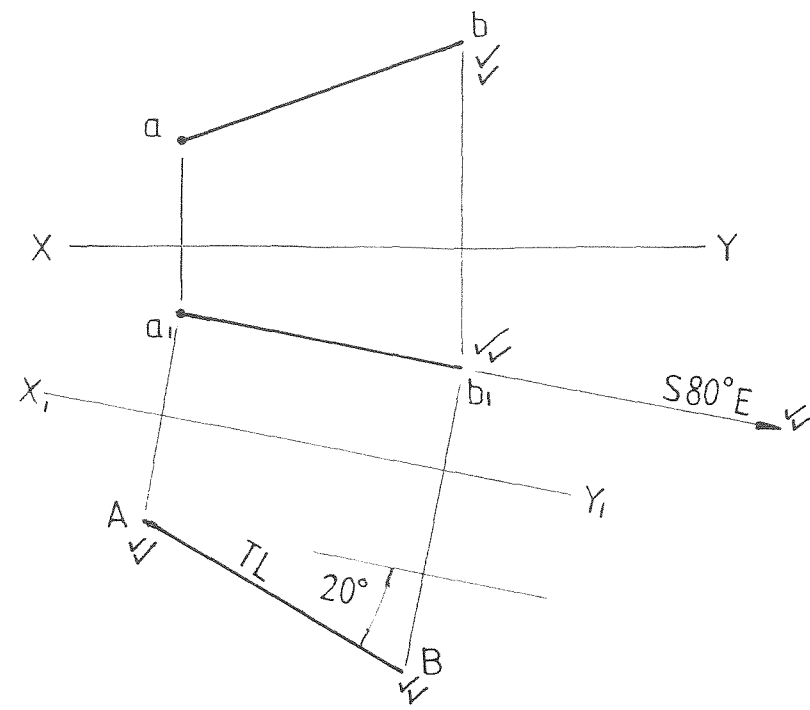


FIG. 1.1

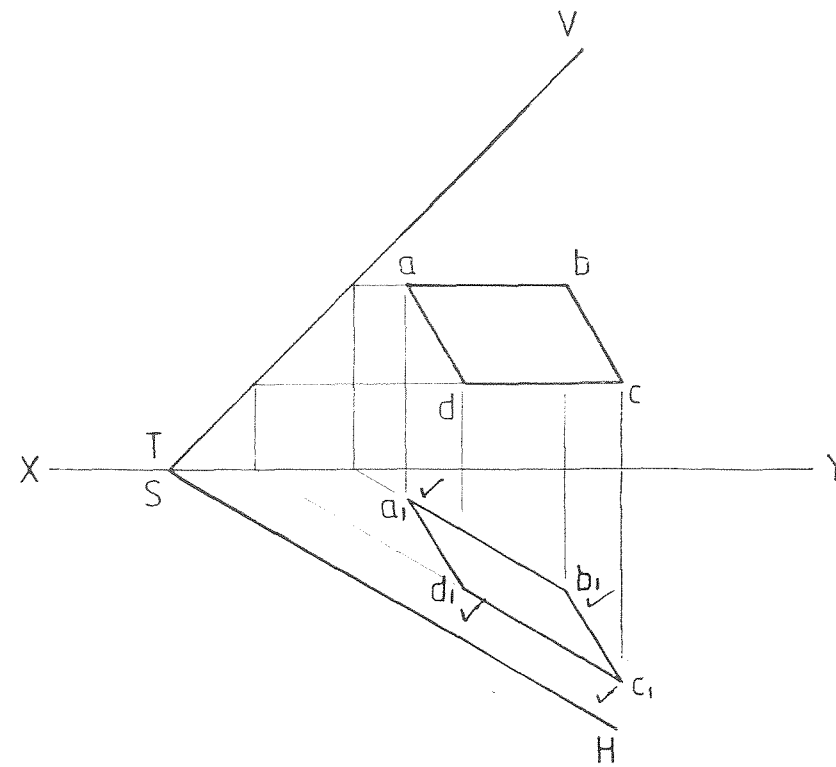


FIG. 1.2

QUESTION 1	MARKS
1.1 Make use of the following information in FIG. 1.1 and complete the front view and top view of line segment AB. 1.1.1 Geographical bearing = S80°E, true length = 40 mm and true angle to the HP = 20° upwards.	10
1.2 Determine the top view of plane figure ABCD lying in the oblique plane in FIG.1.2.	4
1.3 Determine the VT and the front view of line segment AB lying in the oblique plane in FIG.1.3 if the true angle between the oblique plane and the HP = 40°.	9
1.4 Determine the trace (line of penetration) and hidden detail between the two plane figures shown in FIG. 1.4.	7
	<b>30</b>

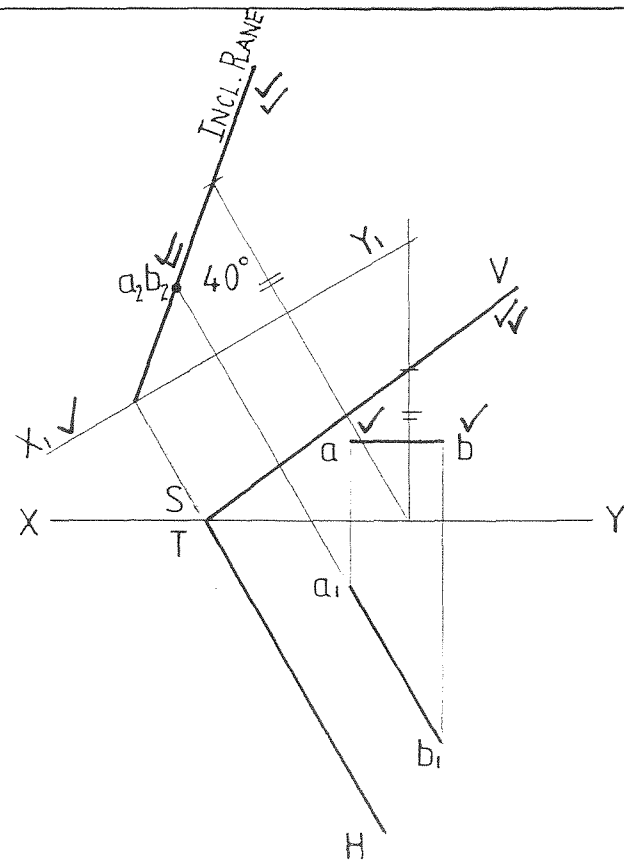


FIG. 1.3

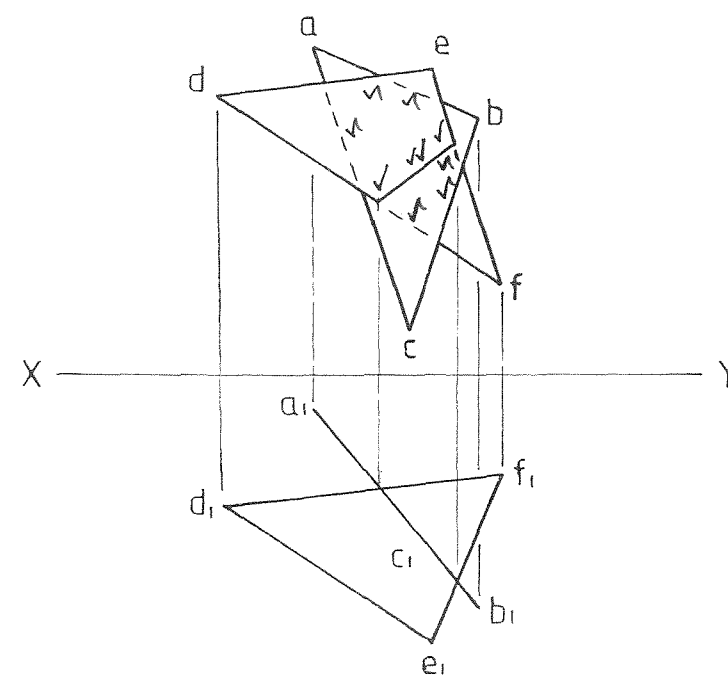


FIG. 1.4

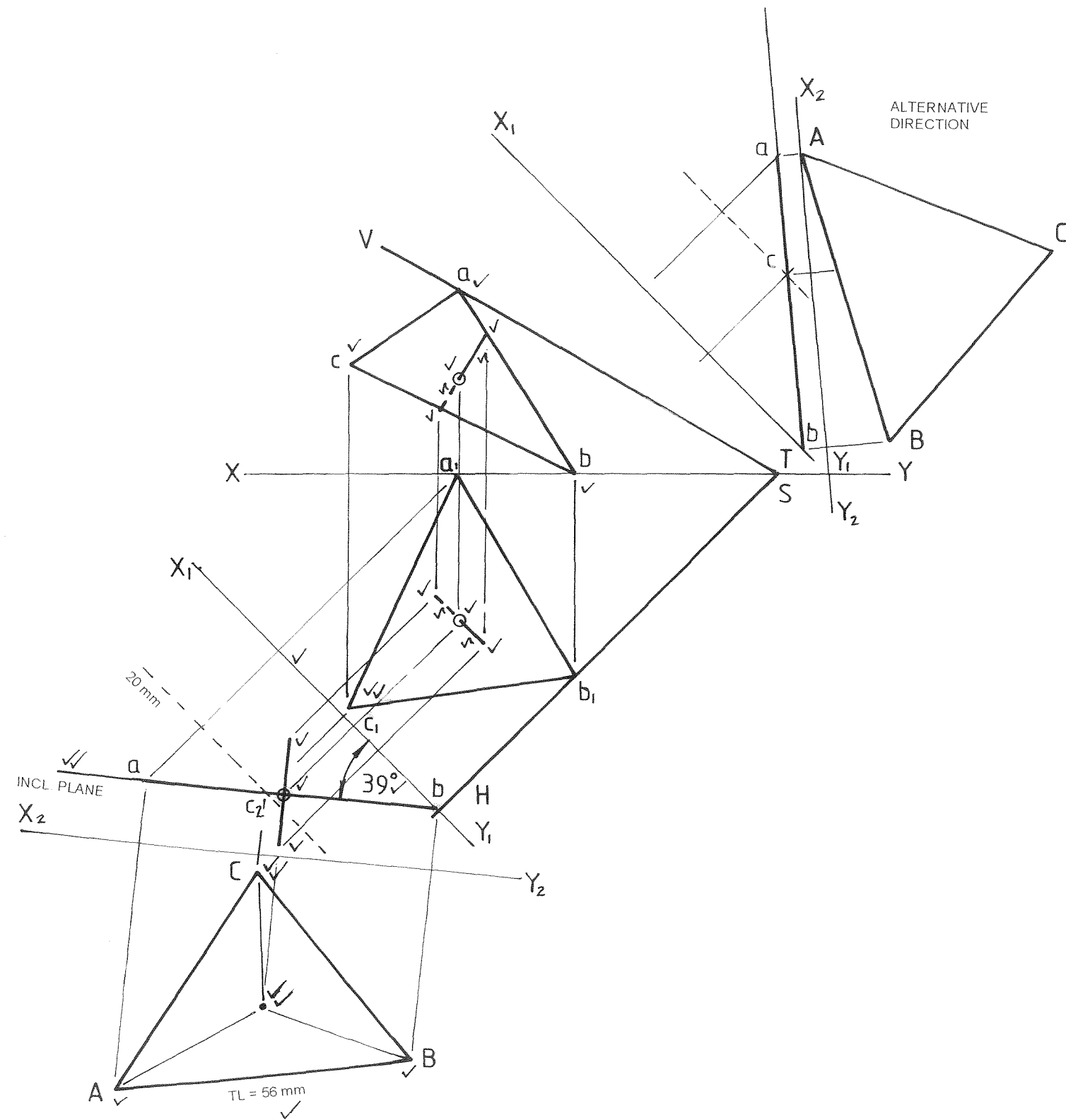
VRAAG 1	PUNTE
1.1 Maak gebruik van die volgende inligting in FIG. 1.1 en voltooi die vooraansig en booaansig van lynstuk AB. 1.1.1 Geografiese ligging = S80°O, ware lengte = 40 mm en ware helling t.o.v. die HV = 20° opwaarts.	10
1.2 Bepaal die booaansig van vlakfiguur ABCD wat op die skuinsvlak lê in FIG. 1.2.	4
1.3 Bepaal die VS en die vooraansig van lynstuk AB wat in die skuinsvlak lê in FIG. 1.3 indien die ware hoek van die skuinsvlak t.o.v. die HV = 40°.	9
1.4 Bepaal die snyspoor (deurdringingslyn) en verborge detail tussen die twee vlakfigure getoon in FIG. 1.4.	7
	<b>30</b>

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ANSWER SHEET  
ANTWOORDVEL 1 QUESTION  
VRAAG 1





**QUESTION 2**

The traces **VTH** of an oblique plane and the top view of side **AB** of a triangular plane figure **ABC** contained in the oblique plane are given.

Point **C** is 20 mm above the **HP** and 20 mm to the left of **A**. The true length of sides **BC** and **AC** are 46 mm and 49 mm respectively. Point **B** rests on the **HP**.

A thin pin with length 20 mm is pierced perpendicularly through the centre of the plane figure **ABC** so that it protrudes 10 mm on each side.

Determine:

- 2.1 The true angle of inclination between plane figure **ABC** and the **HP**
- 2.2 The true shape of plane figure **ABC**
- 2.3 The true length of line segment **AB**
- 2.4 The front view and the top view of plane figure **ABC** with the pin in position. Show the visibility of the pin in all the views.

Tabulate all answers neatly.

**MARKS**

4
4
1
16

25

**VRAAG 2**

Die snypore **VSH** van 'n skuinsvlak asook die boansig van een sy **AB** van 'n driehoekige vlakfiguur **ABC** wat in die skuinsvlak lê, word getoon.

Punt **C** is 20 mm bo die **HV** en 20 mm links van **A**. Die ware lengte van sye **BC** en **AC** is 46 mm en 49 mm respektiewelik. Punt **B** rus op die **HV**. 'n Dun pen met lengte 20 mm dring loodreg deur die middelpunt van vlakfiguur **ABC** sodat dit 10 mm aan elke kant uitsteek.

Bepaal :

- 2.1 Die ware inklinasiehoek tussen vlakfiguur **ABC** en die **HV**
- 2.2 Die ware vorm van vlakfiguur **ABC**
- 2.3 Die ware lengte van lynstuk **AB**
- 2.4 Die vooraansig en boansig van vlakfiguur **ABC** met die pen in posisie. Toon die sigbaarheid van die pen in al die aansigte.

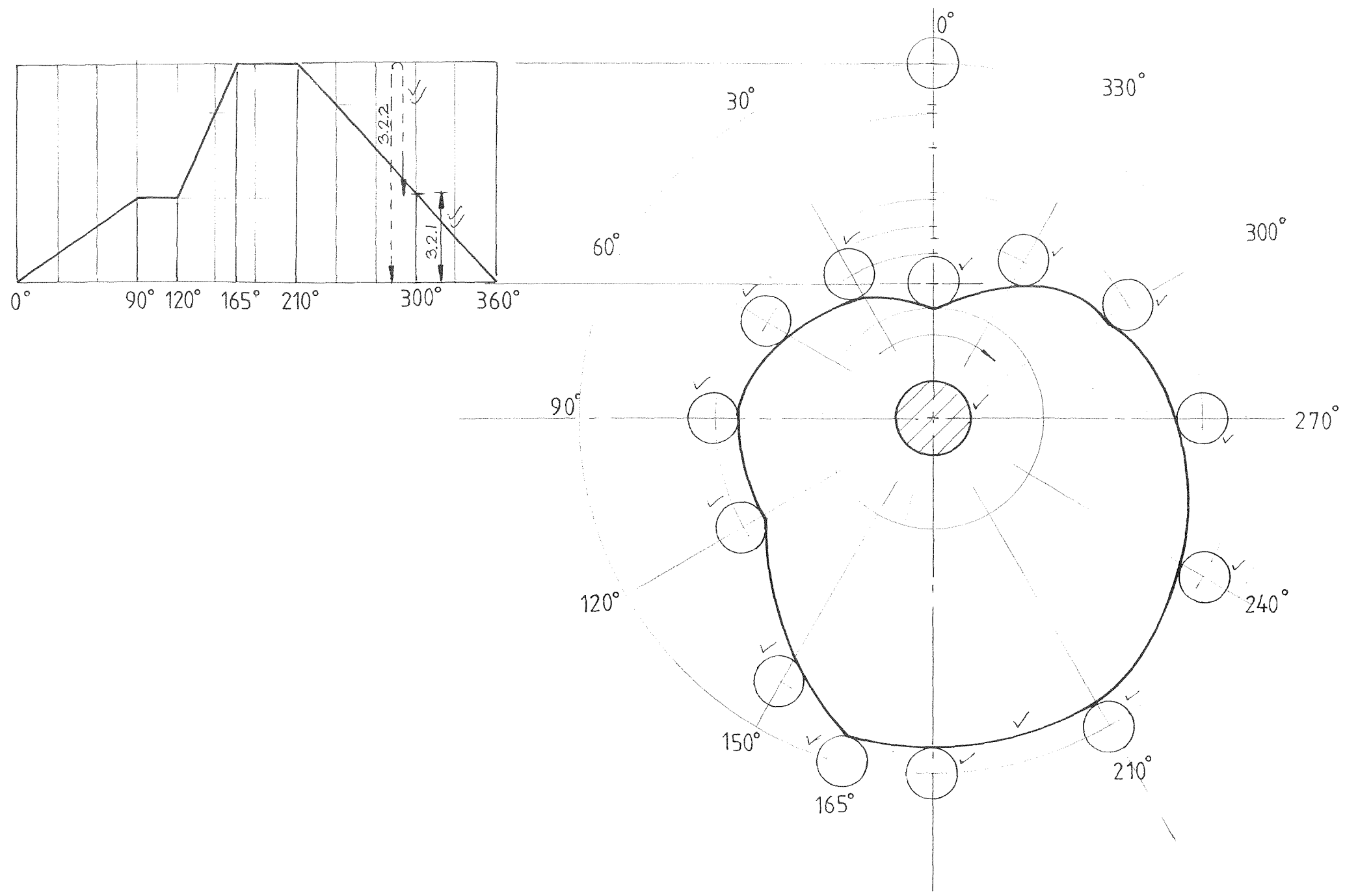
Tabuleer alle antwoorde netjies.

**PUNTE**

4
4
1
16

25





**QUESTION 3**

**MARKS**

The displacement graph for a roller-ended follower is shown.

- 3.1 Draw the cam profile by making use of the following information:
  - 3.1.1 Camshaft diameter = 15 mm
  - 3.1.2 The maximum distance from the bottom of the roller follower to the camshaft centre is 67 mm.
  - 3.1.3 The cam rotates clockwise.
  - 3.1.4 Roller diameter = 10 mm. Show all rollers in position.
- 3.2 Indicate the following on the displacement graph:
  - 3.2.1 Displacement of the follower after 300° rotation
  - 3.2.2 The travel of the follower after 300° rotation

16  
2  
2

Tabulate all answers.

20

**VRAAG 3**

**PUNTE**

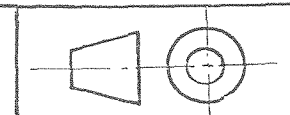
Die verplasinggrafiek vir 'n rollervolger word getoon.

- 3.1 Teken die nokprofiel deur die volgende inligting te gebruik :
  - 3.1.1 Nokasdiameter = 15 mm
  - 3.1.2 Die maksimum afstand tussen die onderkant van die rollervolger en die middelpunt van die nokas = 67 mm.
  - 3.1.3 Die nok roteer kloksgewys.
  - 3.1.4 Roller diameter = 10 mm. Toon al die rollers in posisie.
- 3.2 Toon die volgende aan op die verplasinggrafiek:
  - 3.2.1 Verplasing van die nokvolger na 300° rotasie
  - 3.2.2 Die slag van die volger na 300° rotasie

16  
2  
2

Tabuleer alle antwoorde.

20



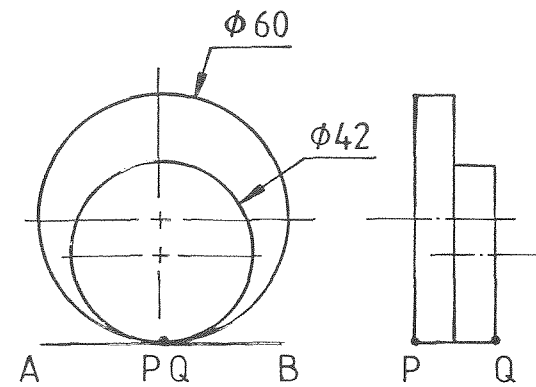


FIG. 4.2

Calculations / Berekeninge

$\frac{\pi d}{12} = \frac{3.14 \times 42}{12}$	$\frac{\pi d}{12} = \frac{3.14 \times 60}{12}$
= 11mm ✓	= 16mm ✓

Name / Benoem

CYCLOID ✓

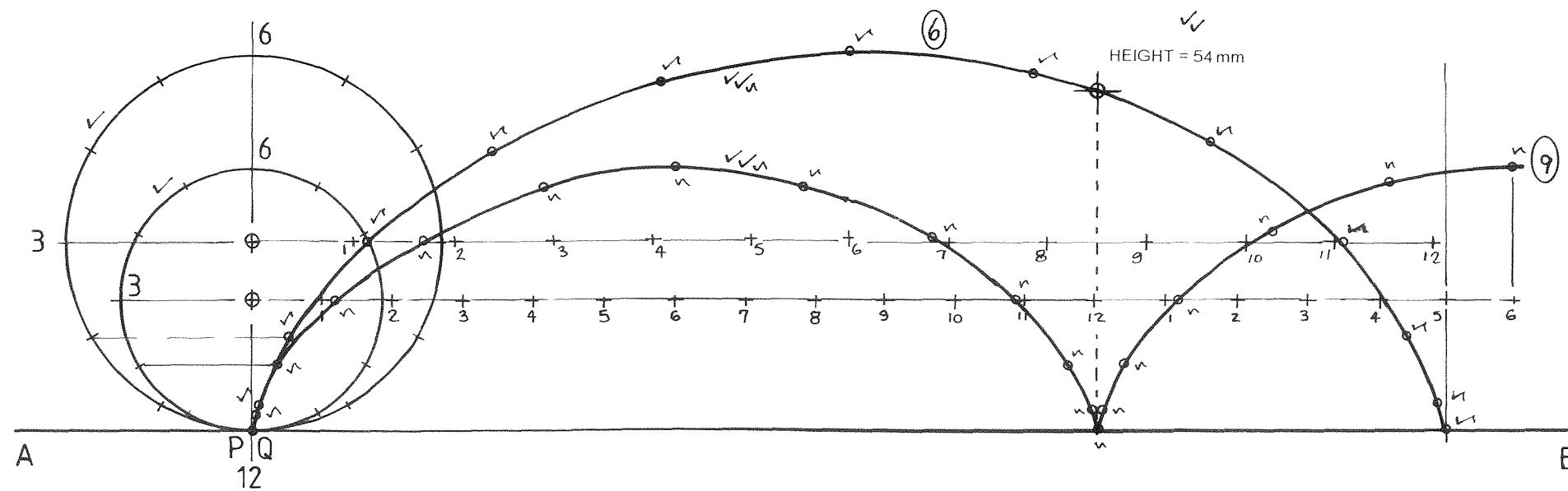


FIG. 4.1

QUESTION 4

FIG. 4.2 shows two wheels that roll along horizontal plane AB shown in FIG. 4.1. Both wheels start at the same point and rotate in the same direction. Complete FIG. 4.1 by using the given dimensions.

Determine:

- 4.1 The curves of point P placed on the big wheel completing one revolution and point Q placed on the small wheel completing one and a half revolutions.
- 4.2 Measure the perpendicular height of P above plane AB where Q again coincides with plane AB.
- 4.3 Show all calculations and name the loci generated.

22  
2  
6

30

VRAAG 4

FIG. 4.2 toon twee wiele wat oor die horisontale vlak AB rol soos in FIG. 4.1 getoon word. Albei wiele begin op dieselfde punt en roteer in dieselfde rigting. Voltooi FIG. 4.1 deur die gegewe afmetings te gebruik.

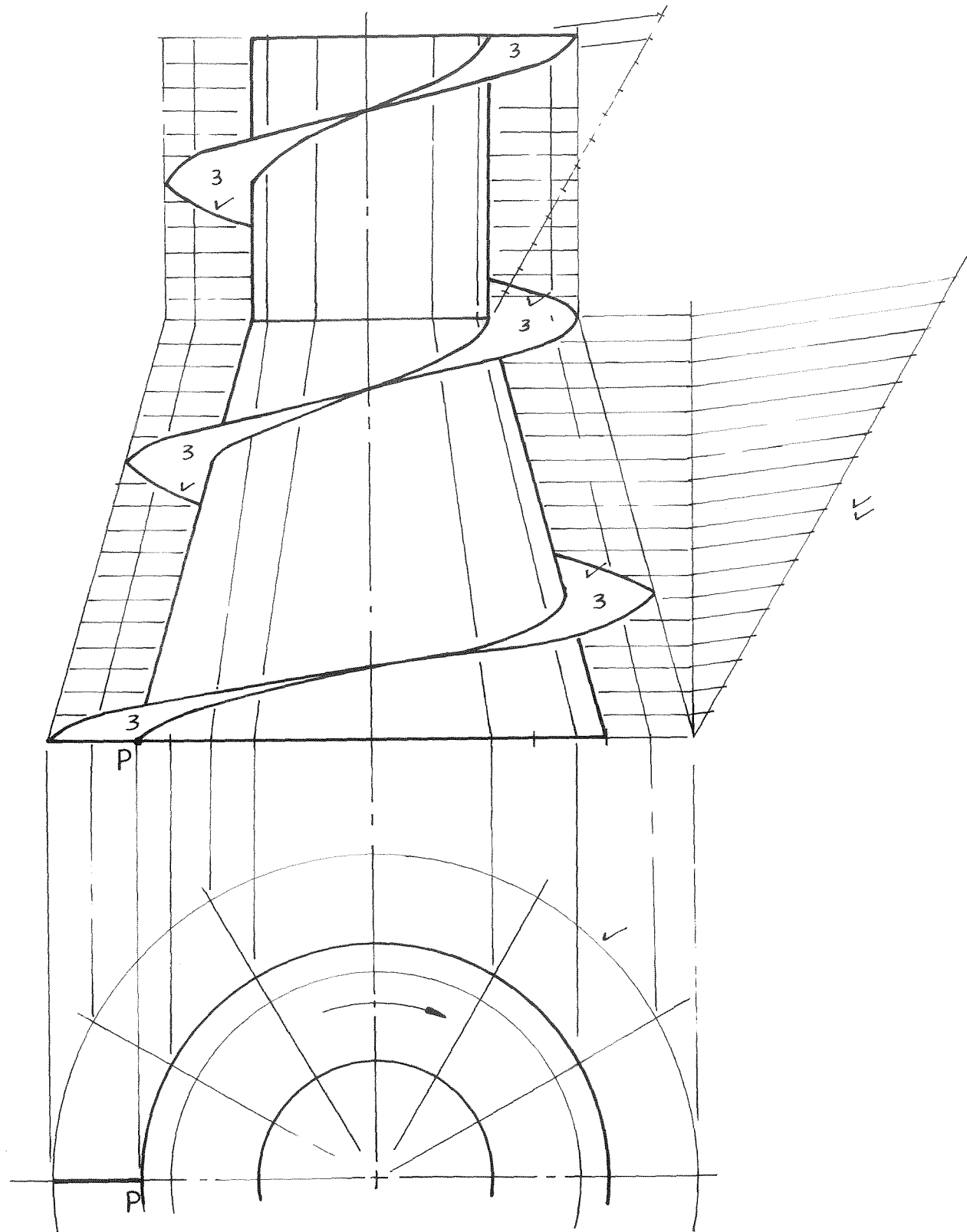
Bepaal:

- 4.1 Die krommes van punt P geplaas op die groot wiel vir een omwenteling voltooi en punt Q geplaas op die klein wiel vir een en 'n halwe omwenteling voltooi.
- 4.2 Meet die loodregte hoogte van punt P bo vlak AB wanneer punt Q weer vlak AB raak.
- 4.3 Toon alle berekeninge en benoem die lokusse gevorm.

22  
2  
6

30





**QUESTION 7**

**MARKS**

The front view and the top view of a truncated cone with a cylinder placed on top of the cone is shown. The top view shows a point **P**.

Determine:

- 7.1 The front view of a right-handed auger starting at point **P** completing one and a half revolutions to the top of the cone and one revolution to the top of the cylinder.  
 The width of the auger is 15 mm. No hidden detail must be shown but all constructions must be shown.

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**VRAAG 7**

**PUNTE**

Die vooraansig en bo aansig van 'n afgeknote kegel met 'n silinder wat bo-op die kegel pas, word getoon. Die bo aansig toon punt **P**.

Bepaal:

- 7.1 Die vooraansig van 'n regterhandse awegaar wat by punt **P** begin deur een en-'n-halwe omwenteling te voltooi tot die bokant van die kegel en een omwenteling tot die bokant van die silinder. Die wydte van die awegaar is 15 mm.  
 Geen verborge detail hoef getoon te word nie, maar alle konstruksies moet getoon word.

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