



education

Department of
Education
FREE STATE PROVINCE

INGENIEURSGRAFIKA EN ONTWERP ENGINEERING GRAPHICS AND DESIGN

GRAAD 12 / GRADE 12

VRAESTEL 2 / PAPER 2

JUNIE 2017 / JUNE 2017

TYD: 3 URE / TIME: 3 HOURS

TOTAAL: 100 / TOTAL: 100

INSTRUKSIES EN INLIGTING

1. Beantwoord alle vrae.
2. ALLE tekeninge is in derdehoekse ortografiese projeksie, tensy anders aangedui.
3. ALLE tekeninge moet volgens skaal 1:1 geteken word, tensy anders aangedui.
4. AL die vrae moet soos voorgeskryf op die VRAESTEL beantwoord word.
5. AL die bladsye moet weer in nommervolgorde vasgekram word, ongeag of die vraag beantwoord is of nie.
6. Tydsbeplanning is noodsaaklik om al die vrae te voltooi.
7. Drukskrif jou naam en van asook die graad in die spasie wat voorsien is op elke bladsy.
8. ALLE antwoorde moet akkuraat en netjies geteken word.
9. Alle nodige konstruksie- en projeksielyne moet getoon word.
10. Beplan elke tekening noukeurig vanaf die beginposisie wat aangedui is op die diagramvelle.
11. Enige besonderhede of afmetings wat nie gegee is nie, moet in goeie verhouding beraam word.

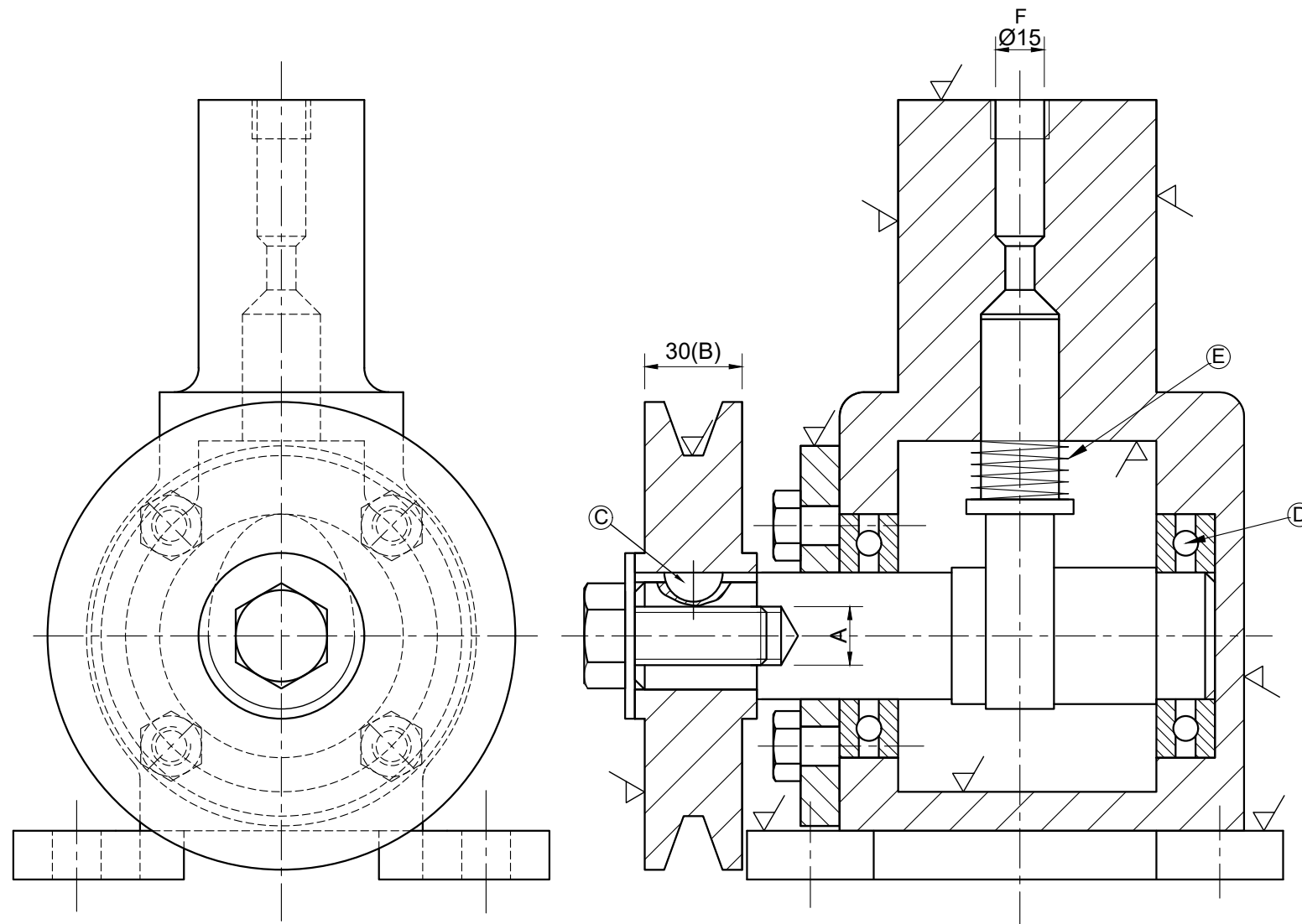
INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. ALL drawings are in third-angle orthographic projection, unless stated otherwise.
3. ALL drawings must be drawn to scale 1:1, unless stated otherwise.
4. ALL questions must be answered on the QUESTION PAPER as instructed.
5. ALL the pages must be restapled in numeric sequence, irrespective of whether the question was attempted or not.
6. Time management is essential in order to complete all the questions.
7. Print your name and surname as well as the grade in the space provided on each page.
8. All answers must be drawn accurately and neatly.
9. All necessary construction and projection lines must be shown.
10. Plan each drawing carefully from the given position, which is indicated on the diagram sheets.
11. Any details or dimensions not given must be assumed in good proportion.

SLEGS VIR AMPTELIKE GEBRUIK FOR OFFICE USE ONLY							
PUNTE / MARKS				MODEREER MODERATE			
1							
2							
3							
4							
TOTAAL TOTAL							
	2	0	0				

FINALE PUNT FINAL MARK	NAGESIEN CHECKED
100	

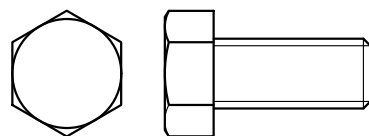
NAAM & VAN NAME & SURNAME		GRAAD GRADE	
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AANSIG 1 / VIEW 1

AANSIG 2 / VIEW 2

M18 BOUT / M18 BOLT



12/6/2017	PAUL	VERANDER VIERKANTIGE SPY NA WOODRUFF SPY CHANGE SQUARE KEY TO WOODRUFF KEY	3
22/5/2017	PAUL	VERWYDER WASTER REMOVE WASHER	2
8/5/2017	PAUL	VERANDER DIE NOK VORM CHANGE THE CAM FORM	1
DATUM DATE	HERSIEN DEUR CHANGED BY	BESKRYWING VAN HERSIENING REVISION DESCRIPTION	Nr. No.

TEKENING NR: DJJD-Z2/DOE | LÊERNAAM: DJJD-2017 | HITTE BEHANDELING: NORMAAL | HOEVEELHEID: 300
DRAWING NO: DJJD-Z2/DOE | FILE NAME: DJJD-2017 | HEAT TREATMENT: NORMAL | QUANTITY: 300

BELTSPANNER
BELT TENSIONER

SKAAL / SCALE
1 : 1

HTS INGENIEURSWERKE
(SA) (Edms.) Bpk.
HTS ENGINEERING WORKS
(SA) (Pty) Ltd

SNELWEG 14
MIGDOL
2775
WWW.HTS.CO.ZA
083 461 4078

TENSY ANDERS VERMELD, IS
ALLE AFMETINGS IN MILLIMETER
MET 'N TOLERANSIE VAN 0,25.

UNLESS OTHERWISE SPECIFIED,
ALL DIMENSIONS ARE IN
MILLIMETRES WITH A
TOLERANCE OF 0,25.

NAGESIEN: C MEYER
DATUM: 06-05-2017
CHECKED: C MEYER
DATE: 06-05-2017

GOEDGEKEUR: M SMITH
DATUM: 28-06-2017
APPROVED: M SMITH
DATE: 28-06-2017

TEKENPROGRAM:
DRAWING PROGRAM:
AUTO CAD 16

GETEKEN: P VISAGE
DATUM: 01-05-2017
DRAWN: P VISAGE
DATE: 01-05-2017

VRAAG 1
ANALITIES (MEGANIES)

Gegee:
'n Tabel van vrae en onderdele van 'n Vibrasie-eenheid.
Die deursnee-aansig is geteken volgens snyvlak A-A
Instruksies:
Voltooi die tabel deur die antwoorde, wat verwys na die samestelling, netjies te drukskryf in die voorbereide kolom.

QUESTION 1
ANALYTICAL (MECHANICAL)

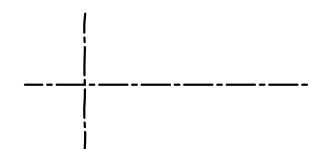
Given:
A table with questions and parts of a Vibration unit.
The sectional view is drawn to cutting plane A-A
Instructions:
Complete the table by means of answers, that refer to the assembly, by printing it neatly in the prepared column.

NO	VRAE / QUESTIONS	ANTWOORDE / ANSWERS	KOR COR	E	M
1	Op watter datum was die tekening nagesien? On what date was the drawing checked?		1		
2	In watter dorp is die vervaardigingsmaatskappy geleë? In which town is the manufacturing company situated?		1		
3	In watter SI-eenheid word die afmetings voorgestel? In which SI unit are the dimensions presented?		1		
4	Wat is die lêernaam? What is the file name?		1		
5	Hoeveel oppervlaktes moet gemasjineer word? How many surfaces must be machined?		1		
6	Benoem aansig 1. Name view 1.		1		
7	Watter tipe hittebehandeling word verlang? What type of heat treatment is required?		1		
8	Op watter datum is die laaste hersiening gemaak? On what date was the last revision made?		1		
9	Bepaal die afmetings by A: Determine the dimensions at A:		2		
10	Wat sal die afmeting (B) wees indien 'n skaal 1:5 gebruik is? What would the dimension (B) be if a scale 1:5 was used?		1		
11	Wat word onderdeel C genoem? What is part C called?		2		
12	Wat word onderdeel D genoem? What is part D called?		1		
13	Wat word onderdeel E genoem? What is part E called?		1		
14	Met verwysing na die toleransie, bepaal die minimum grootte van die gat by H? With reference to the tolerance, determine the minimum size of the hole at H?		2		
15	Met verwysing na die toleransie, bepaal die maksimum grootte van die gat by H? With reference to the tolerance, determine the maximum size of the hole at H?		2		
16	In die blok hieronder, (ANTWOORD 16), teken, in netjiese vryhand, die simbool wat vir die projeksiesisteen gebruik word. In the box below, (ANSWER 16), draw, in neat freehand, the symbol for the projection system used.		4		
17	Die snyvlak A-A is nie aangedui. Teken dit op aansig 1 of aansig 2 korrek. Cutting plane A-A is not indicated. Draw it on view 1 or view 2 correctly.		3		

ANTWOORD 16
ANSWER 16

VRYHAND
FREE HAND

TOTAAL / TOTAL 26



DIAGRAMVEL 1
DIAGRAM SHEET 1

VRAAG 1
QUESTION 1

INGENIEURSGRAFIKA EN ONTWERP
ENGINEERING GRAPHICS AND DESIGN

JUNIE 2017 VRAESTEL 2
JUNE 2017 PAPER 2

NAAM & VAN
NAME & SURNAME

GRAAD
GRADE



VRAAG 2: MEGANIESE SNIT

Gegee:

Die vooraansig en bo-aansig. Die onvoltooide vooraansig en die onvoltooide bo-aansig van 'n gietstuk in D.O.P.

Instruksies:

Gebruik skaal 1 : 1, beantwoord die volgende:

- 2.1 Voltooi die voor- en bo-aansig.
(ALLE konstruksies moet getoon word by die kurwe(s))
- 2.2 'n Deursnee linkeraansig volgens snyvlak BB
(ALLE konstruksies moet getoon word by die kurwe(s))

Nota:

Alle onbekende kurwes is R5

QUESTION 2: MECHANICAL SECTION

Given:

The front view and top view. The incomplete front view and an incomplete top view of a casting in T.A.O.P.

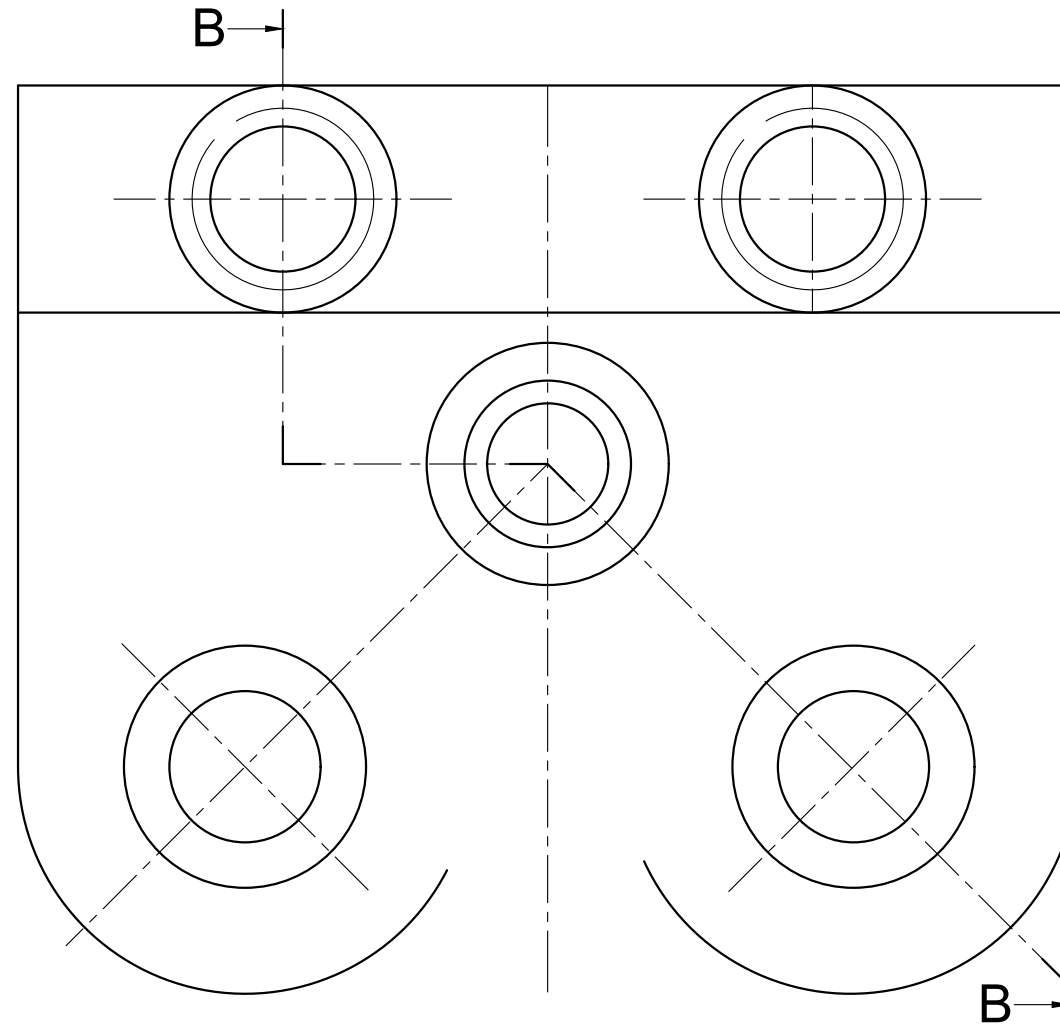
Instructions:

Using scale 1 : 1, answer the following:

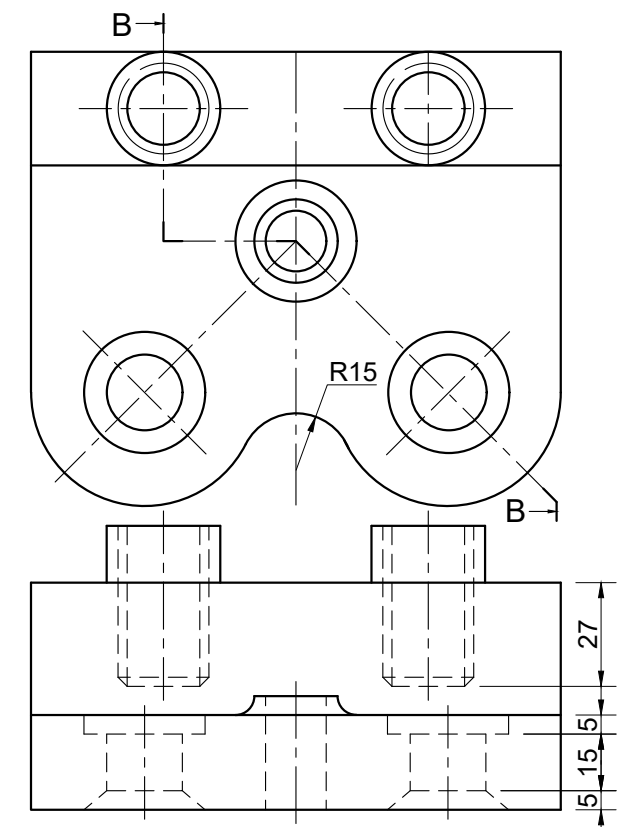
- 2.1 Complete the front - and top view.
(ALL constructions must be shown at the curve(s))
- 2.2 A sectional left view according to cutting plane BB
(ALL constructions must be shown at the curve(s))

Note:

All unknown curves are R5



MEGANIESE SNIT / MECHANICAL SECTION		KOR COR	E	M
1	VOORAANSIG + BO-AANSIG FRONT VIEW + TOP VIEW (37/2)	18.5		
2	DEURSNIE LINKERAANSIG SECTIONAL LEFT VIEW (41/2)	20.5		
TOTAAL TOTAL		39		





VRAAG 3: ISOMETRIES

Gegee:

Die vooraansig en linkeraansig van 'n GIETSTUK.

Instruksies:

Deur gebruik te maak van skaal 1 : 1, omskep die ortografiese-aansigte van die GIETSTUK in 'n isometriese tekening.

Maak A die laagste punt op die tekening.
Wys ALLE noodsaaklike konstruksies.
GEEN verborge detail word verlang nie.

QUESTION 3: ISOMETRIC

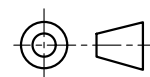
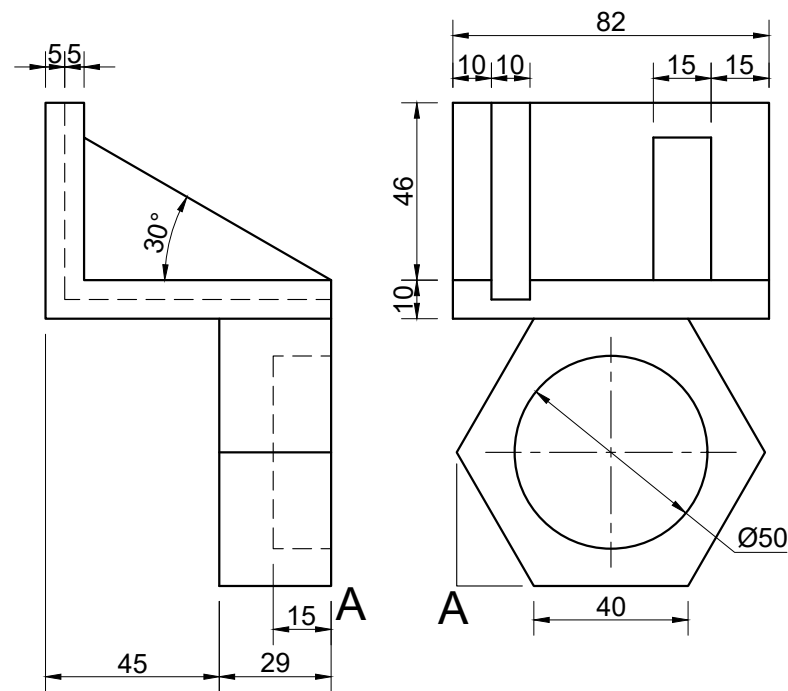
Given:

The front view and a left view of a casting.

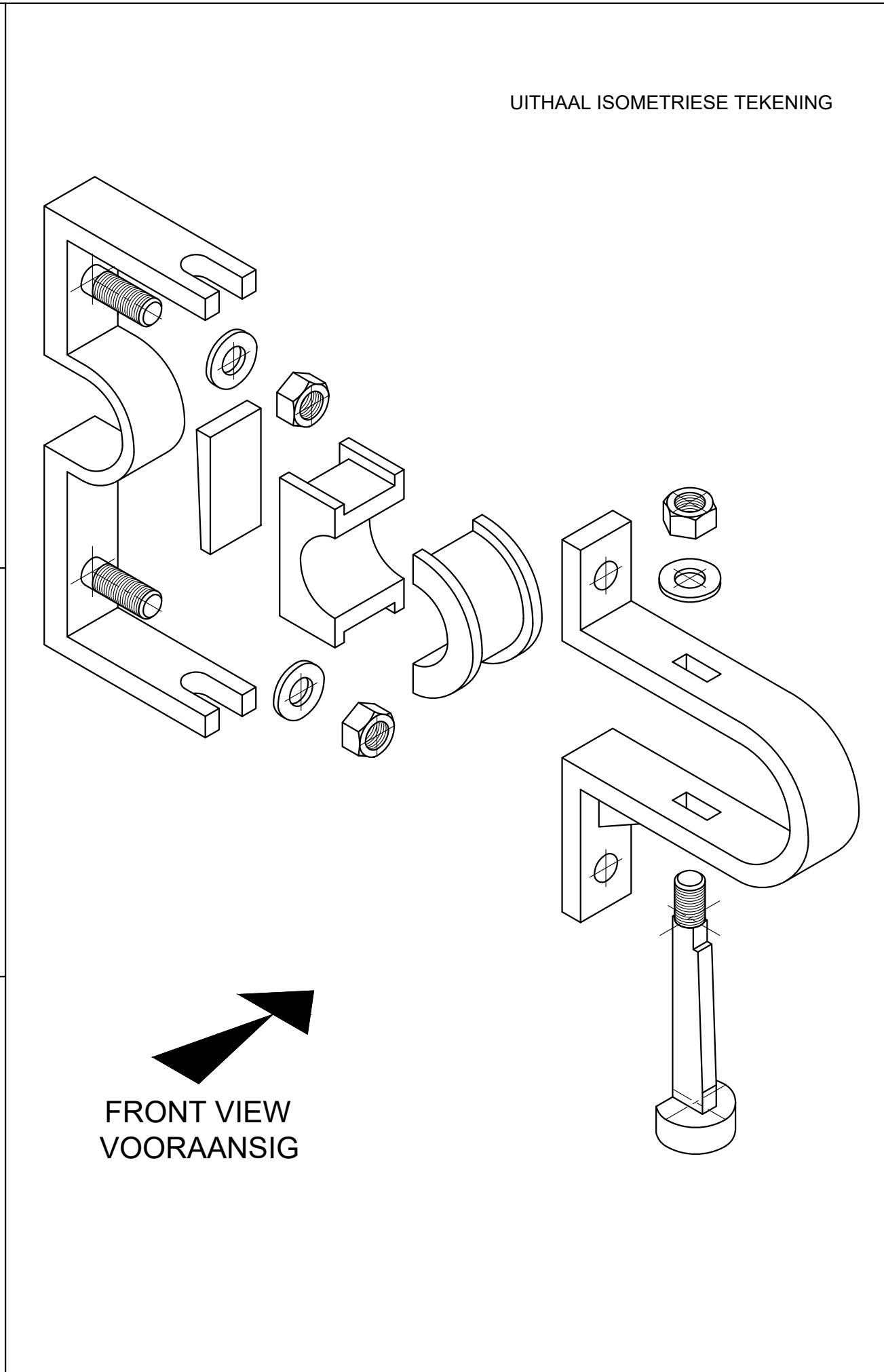
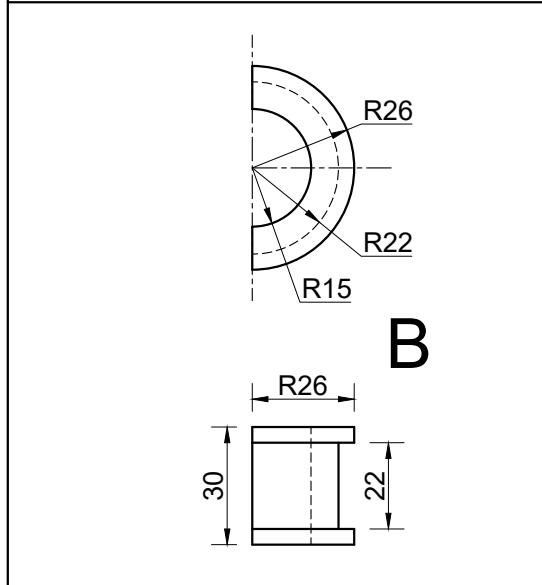
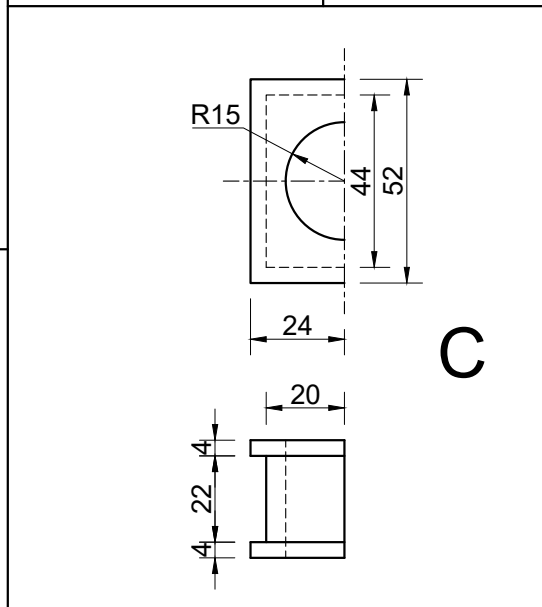
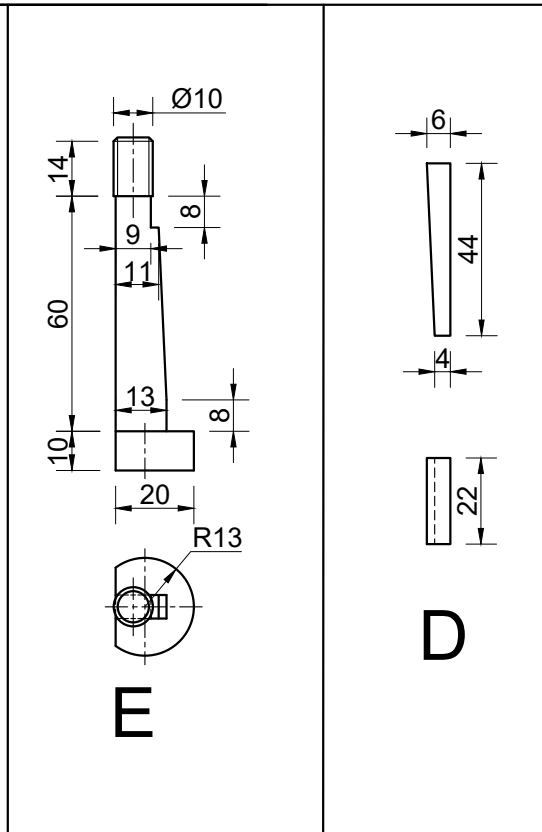
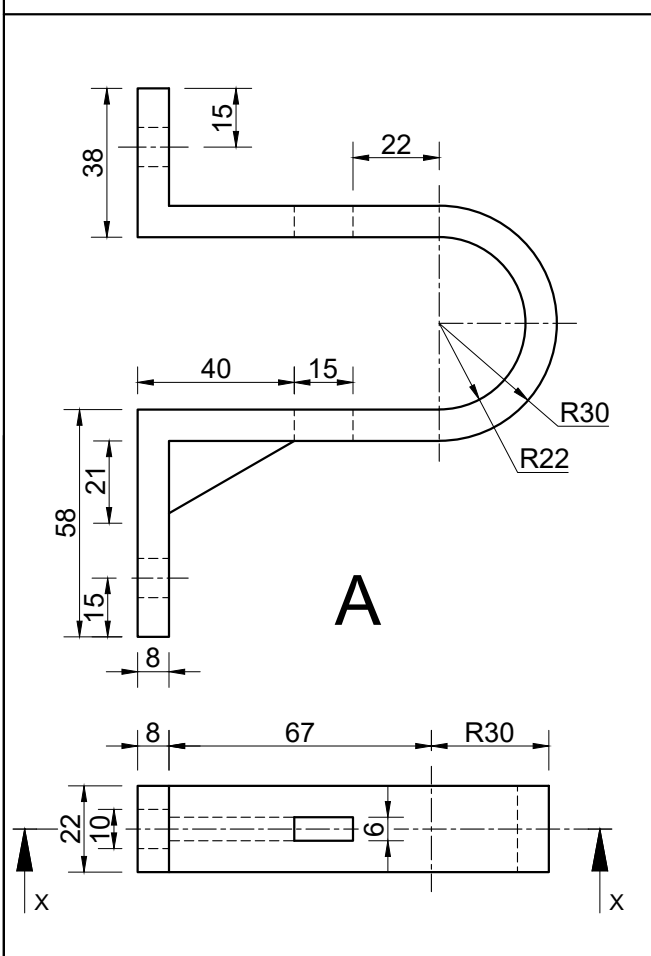
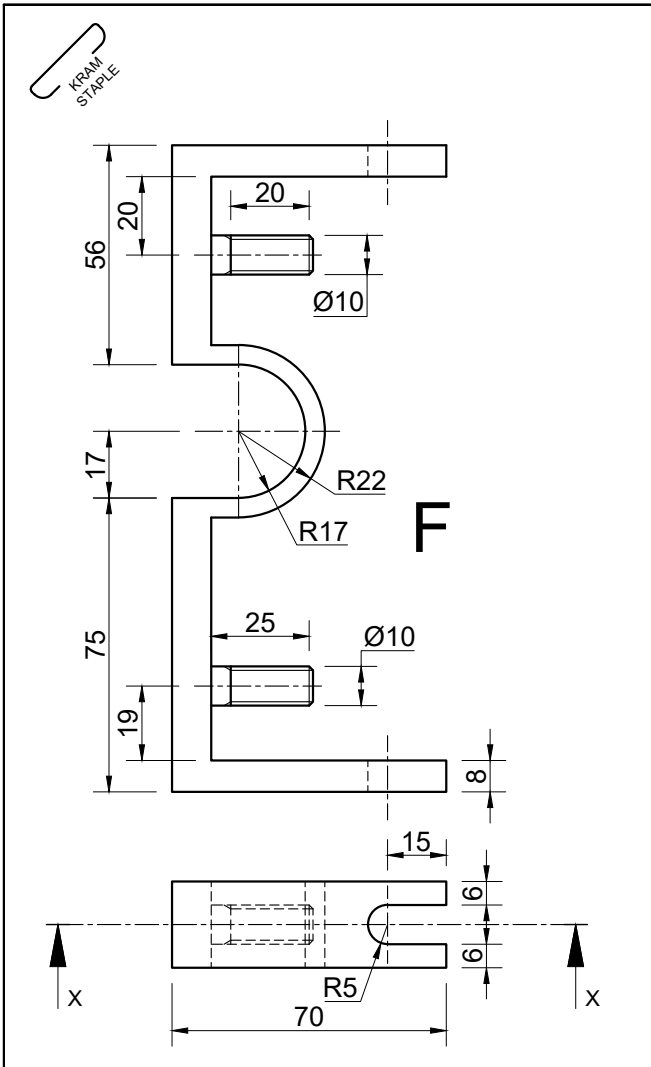
Instructions:

Using scale 1 : 1, convert the orthographic views of the casting into a isometric drawing.

Make A the lowest point of the drawing.
Show ALL necessary construction.
NO hidden detail is required.



ISOMETRIES ISOMETRIC		E	M
1	HULPAANSIG + PLASING AUXILIARY VIEW + PLACEMENT	6	
2	ISOMETRIESELYNE & NIE ISOMETRIESELYNE ISOMETRIC LINES & NON ISOMETRIC LINES (35/2)	17.5	
3	SIRKEL + KONSTRUKSIE CIRCLE + CONSTRUCTION (15/2)	7.5	
4	SESKANT HEXAGON	9	
TOTAAL TOTAL		40	



**VRAAG 4
SAMESTELLING**

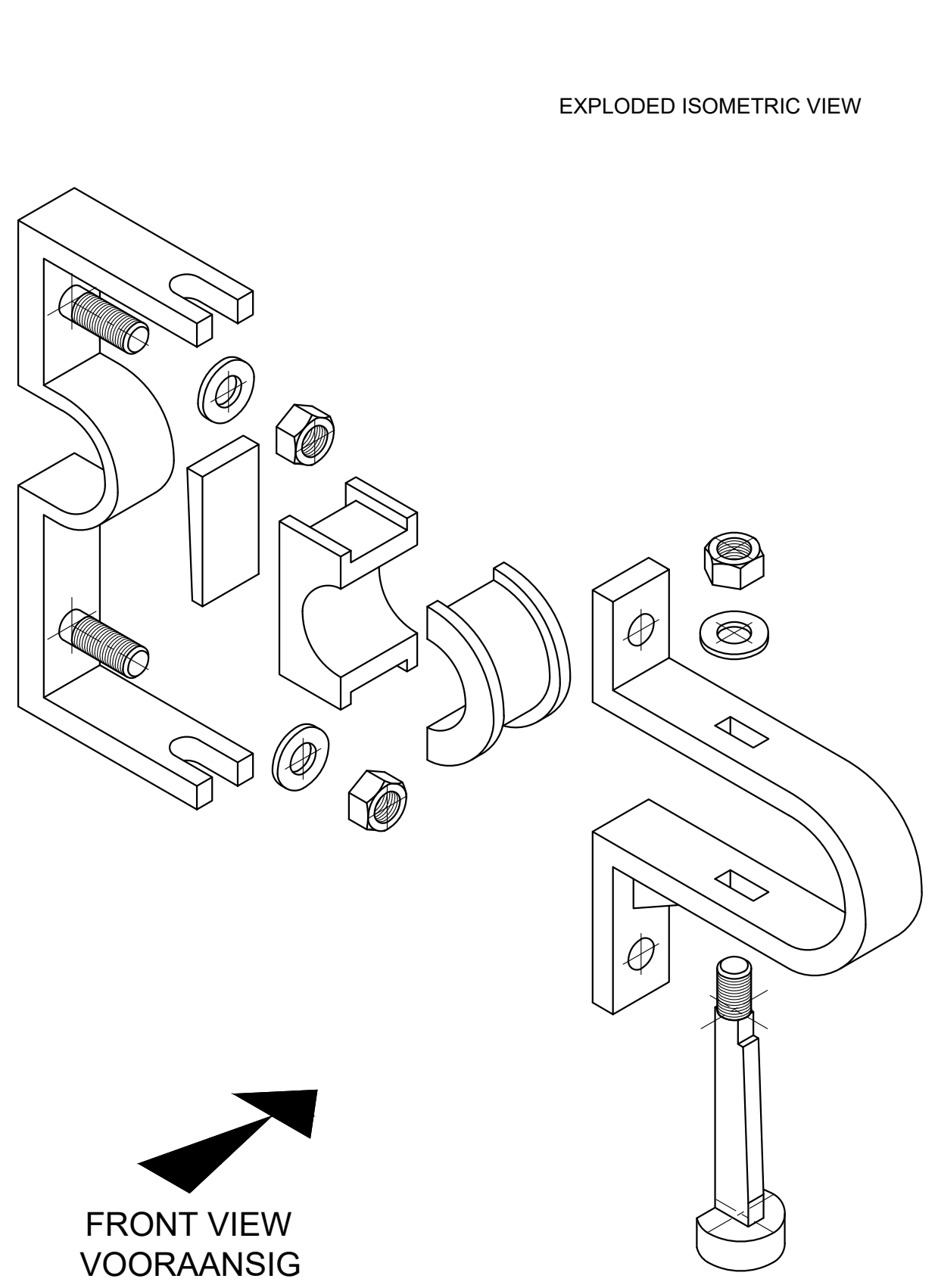
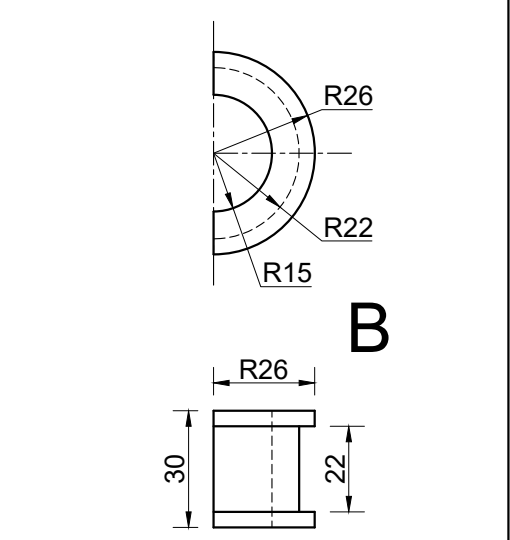
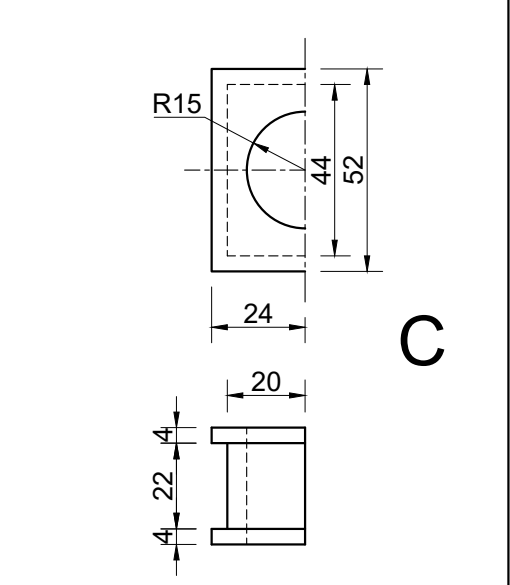
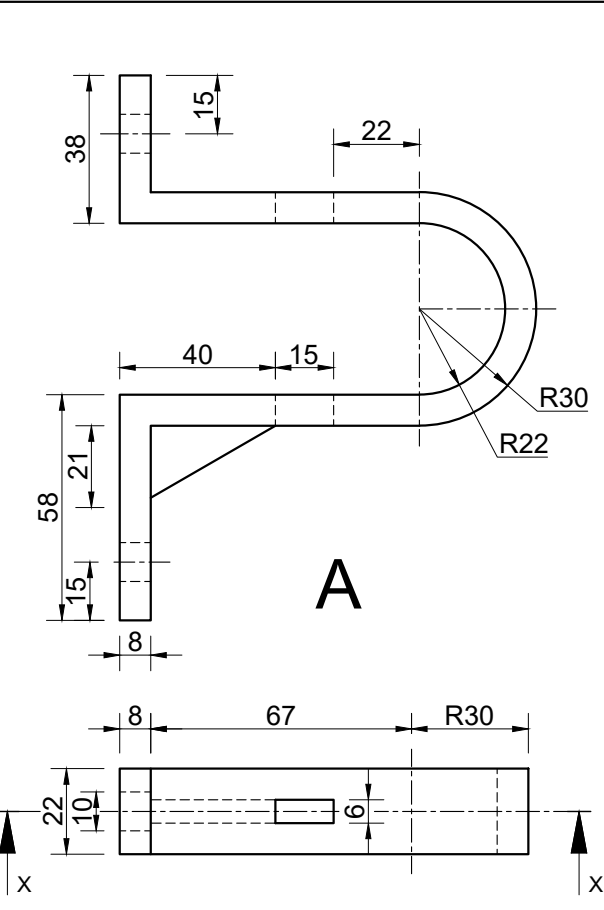
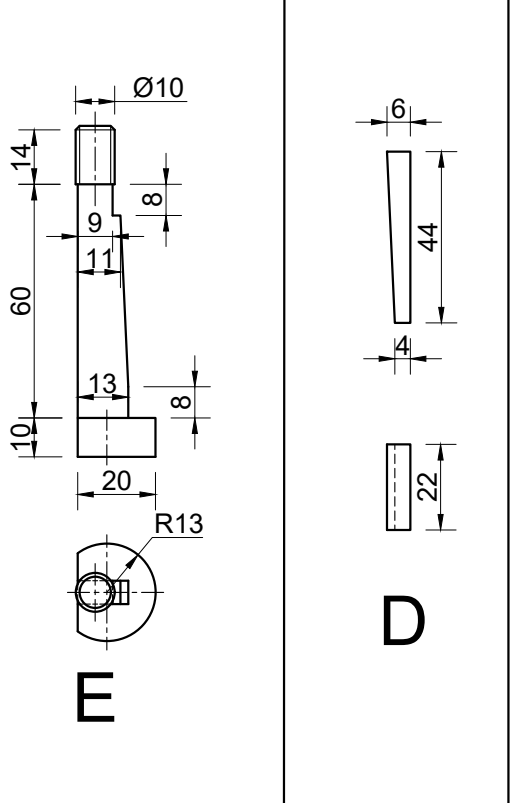
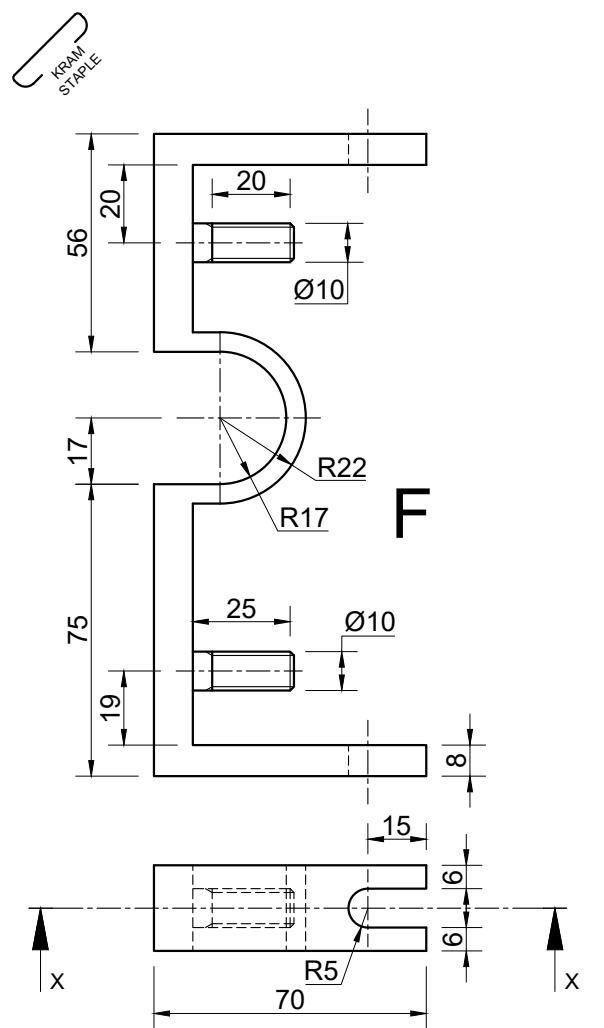
Gegee:
Diagramvel 4A toon die vooraansig en bo-aansig van die komponente van 'n DRYFASSTUT in E.O.P.
Diagramvel 4A toon 'n uithaal-isometriese tekening.

- Instruksies:**
- Teken op diagramvel 4B volgens skaal 1 : 1 en in D.O.P. die volgende aansig:
- 4.1 'n Deursnee vooraansig volgens snyvlak XX.
 - 4.2 'n Regteraansig.
 - 4.3 Skryf die titel en skaal in die voorsiene spase
 - DRYFASSTUT**
 - SKAAL 1 : 1**
 - 4.4 Teken die projeksiesimbool in die voorsiene spase.
 - 4.5 Toon die volgende op die regte aansig:
 - 4.5.1 Die snyvlak X-X.

- Notas:**
- Geen verborge detail word verlang nie.
 - ALLE tekeninge moet voldoen aan die riglyne vervat in SANS 0111.
 - Gebruik die uithaal isometriese tekening om te kyk watter sye van die moer moet getoon word.

LYS VAN ONDERDELE

NO	ONDERDEEL	AANTAL
A	MONTEERRAAM	1
B	VOORSTE LAERHELFT	1
C	AGTERSTE LAERHELFT	1
D	DRUKPLAAT	1
E	SPEZIALE BOUT	1
F	MONTEERPLAAT	1
G	WASTER (NIE GETOON)	3
H	M10 SESKANTIGEMOER (NIE GETOON)	3



EXPLODED ISOMETRIC VIEW

FRONT VIEW
VOORAANSIG

**QUESTION 4
ASSEMBLY**

Given:
Diagram sheet 4A shows the front view and top view of the components of a DRIVE SHAFT SUPPORT in F.A.O.P.
Diagram sheet 4A shows an exploded isometric drawing.

Instructions:
Draw on diagram sheet 4B using scale 1 : 1 and in T.A.O.P. the following view:

- 4.1 A sectional front view according to cutting plane XX.
- 4.2 A right view.
- 4.3 Write the title and scale in the space provided.
- DRIVE SHAFT SUPPORT**
- SCALE 1 : 1**
- 4.4 Draw the projection symbol in the space provided.
- 4.5 Add the following on the correct view:
 - 4.5.1 The cutting plane X-X.

Notes:

- No hidden detail is needed.
- ALL drawings must comply with the guidelines contained in the SANS 0111.
- Use the exploded isometric drawing to see how many sides of the nut must be shown.

LIST OF PARTS		
NO	PART	QUANTITY
A	MOUNTING FRAME	1
B	FRONT BEARING HOUSING	1
C	REAR BEARING HOUSING	1
D	PRESSURE PLATE	1
E	SPECIAL BOLT	1
F	MOUNTING PLATE	1
G	WASHER (NOT SHOWN)	3
H	M10 HEXAGONAL NUT (NOT SHOWN)	3



DEURSNEE VOORAANSIG SECTIONAL FRONT VIEW			KOR COR	E	M
1	MONTEERRAAM MOUNTING FRAME (27/2)	13.5			
2	VOORSTE LAERHELFTTE FRONT BEARING HOUSING (4/2)	2			
3	AGTERSTE LAERHELFTTE REAR BEARING HOUSING (5/2)	2.5			
4	DRUKPLAAT PRESSURE PLATE (5/2)	2.5			
5	SPEZIALE BOUT SPECIAL BOLT (14/2)	7			
6	MONTEERPLAAT MOUNTING PLATE (41/2)	20.5			
7	WASTER WASHER (6/2)	3			
8	M10 MOER M10 NUT (10/2)	5			
SUB-TOTAAL SUB-TOTAL			56		

REGTERAANSIG RIGHT VIEW			KOR COR	E	M
1	MONTEERRAAM MOUNTING FRAME (11/2)	5.5			
2	VOORSTE LAERHELFTTE FRONT BEARING HOUSING (6/2)	3			
5	SPEZIALE BOUT SPECIAL BOLT (8/2)	4			
6	MONTEERPLAAT MOUNTING PLATE (8/2)	4			
7	WASTER WASHER (2/2)	1			
8	M10 MOER M10 NUT (17/2)	8.5			
SUB-TOTAAL SUB-TOTAL			26		

TEGNIESE VERSORGING TECHNICAL PROVISION			KOR COR	E	M
9	SNYVLAK A-A + SENTERLYNE SECTIONAL PLANE A-A + CENTRE LINES (18/2)	9			
10	TITEL & SKAAL TITLE & SCALE	2			
11	PROJEKSIESIMBOOL PROJECTION SYMBOL	2			
SUB-TOTAAL SUB-TOTAL			13		
TOTAAL TOTAL			95		

PROJEKSIESIMBOOL / PROJECTION SYMBOL 	TITEL / TITLE
	SKAAL / SCALE