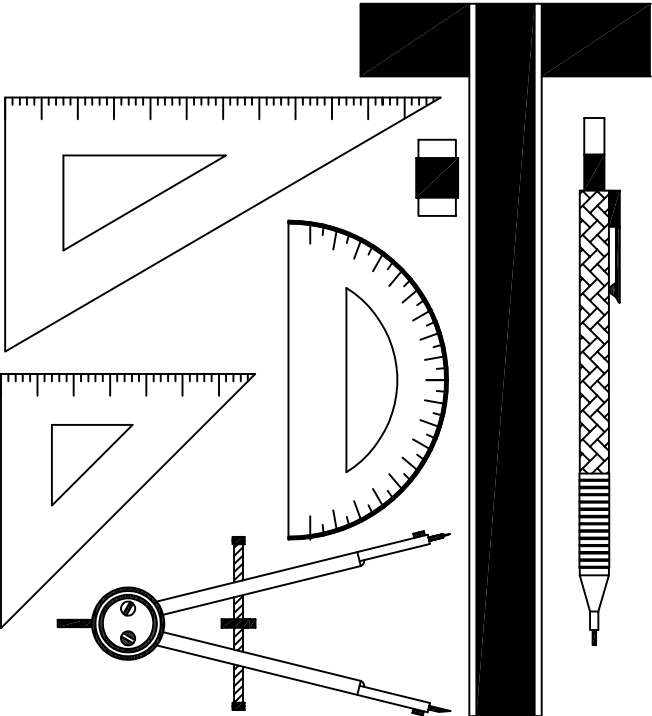


MARKING GUIDELINES



NATIONAL SENIOR CERTIFICATE EXAMINATION

2021

ENGINEERING GRAPHICS AND DESIGN

PAPER 1

MARKS: 200

TIME: 3 HOURS

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

- 1. This question paper consists of **6 pages** including the cover page and **4 questions**.
- 2. **All** questions must be answered.
- 3. Unless specified otherwise, all questions are in **First-angle Orthographic Projection**.
- 4. Unless specified otherwise, all questions are to be completed to a **scale of 1:1**.
- 5. **All** answer sheets must be restapled in numerical order, even questions that have not been answered.
- 6. **All construction work** must be shown.
- 7. Print your **examination number** neatly on each page.
- 8. Use only the **answer sheets** provided.
- 9. Your drawings should reflect **neatness** and **accuracy**.
- 10. All dimensions or detail not given must be **assumed** in **good proportion**.
- 11. Your drawings should comply with SANS 10143.

FOR OFFICIAL USE ONLY						
QUESTION	SECTION	MARK			MODERATED	MAXIMUM
1	CIVIL ANALYTICAL					20
2	INTERPENETRATION & DEVELOPMENT					40
3	TWO-POINT PERSPECTIVE					40
4	CIVIL DRAWING					100
	TOTAL					200

CHECKED BY

EXAMINATION NUMBER

QUESTION 1

CIVIL

ANALYTICAL

The site plan shows a residential property with the following features and dimensions:

- EXISTING DWELLING (ERF 3002):** A central rectangular structure with a width of 7200 and a depth of 5200.
- PROPOSED NEW GARAGE:** Attached to the existing dwelling, with a width of 7200 and a depth of 5200.
- Boundaries and Bearings:**
 - Top boundary: BL 1000, bearing 613.
 - Right boundary: BL 1000, bearing 612.
 - Bottom boundary: BL 1000, bearing 613.
 - Left boundary: BL 1500, bearing 614.
- Other Features:**
 - Two trees are shown in the top-left corner.
 - A dashed rectangle is shown in the bottom-left corner.
 - Various annotations include "W", "RE", "IE", "W", and "W".
 - Dimensions: 5200, 7200, 32551, 39444, 23624, 23158, 4580, 611, 612, 613, 614, 615.

STUDY THE ABOVE DRAWING AND ANSWER THE QUESTIONS THAT FOLLOW.

CIRCLE THE LETTER CORRESPONDING TO YOUR ANSWER

1.1 Which ERF is to the SOUTHWEST of ERF 3002?						1		
A	ERF 5016	B	ERF 5015	C	ERF 5014	D	ERF 3001	
1.2 What does the abbreviation 'IE' stand for?								
A	INDUCTION EYE	B	INSPECTION EYE	C	INDUCTION EYE	D	INSPECTION EYE	1
1.3 How many trees need to be removed on ERF 3002?								
A	4	B	6	C	2	D	1	1
1.4 In which direction would you be walking, if you walked up the stairs?								
A	NORTH	B	SOUTH	C	EAST	D	WEST	1
1.5 Which corner has the highest elevation?								
A	A	B	C	C	D	D	E	1
1.6 What is the feature at 1 called?								
A	BEACON HEIGHT	B	ERF NUMBER	C	DIMENSION	D	CORNER NUMBER	1
1.7 What is the feature at 2 called?								
A	BOUNDARY LABEL	B	BOUNDARY LINE	C	BUILDING LINE	D	BUILDING LABEL	1

1.8 What is the feature at 3 called?	A	WASTE TANK	B	WATER TANK	C	WATER METER	D	ELECTRICITY METER	1
1.9 What is indicated by the dashed line at feature 4?	A	SEPTIC TANK	B	HIDDEN DETAIL	C	WORK TO BE REMOVED	D	WATER TANK	1
1.10 What is the feature at 5 called?	A	DOG KENNEL	B	GULLY	C	SEPTIC TANK	D	STEP	1
1.11 What is the feature at 6 called?	A	DRAIN LINE	B	SEWER LINE	C	WATER PIPE	D	CONTOUR	1
1.12 How close to ERF 5015 could a new building be built?	A	1500 mm	B	1000 mm	C	1500 m	D	1000 m	1
1.13 How many inspection eyes are there in the drawing?	A	1	B	2	C	4	D	6	1
1.14 How wide is the driveway?	A	5000	B	5200	C	1000	D	23158	1
1.15 In the space below, determine the area of the proposed new garage in metres squared. (m ²) Round your answer off to 2 decimal places.	<p style="text-align: center;"> $\text{Area} = \text{length} \times \text{breadth}$ $= 5.2 \text{ m} \times 7.2 \text{ m}$ $= 37.44 \text{ m}^2$ </p>								2
1.16 Which of the following symbols correctly indicate a fire extinguisher according to SANS 10143?	<p style="text-align: right;">Answer: 37.44 m²</p>								
1.17 Which of the following options indicates the largest slope of ERF 3002?	A	NORTH TO SOUTH	B	SOUTHWEST TO NORTHEAST	C	EAST TO WEST	D	NORTHWEST TO SOUTHEAST	1
1.18 In the space below, draw, in NEAT freehand, the PLAN VIEW and ELEVATION VIEW of the SANS 10143 graphical symbol for a wash basin.	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="text-align: center;">PLAN VIEW</p> <div style="border: 1px solid black; width: 100px; height: 50px; margin: 10px auto; position: relative;"> ° </div> </div> <div style="width: 45%;"> <p style="text-align: center;">ELEVATION VIEW</p> <div style="border: 1px solid black; width: 100px; height: 50px; margin: 10px auto;"></div> </div> </div>								2

ANSWER SHEET 1

EXAMINATION NUMBER

20 MARKS

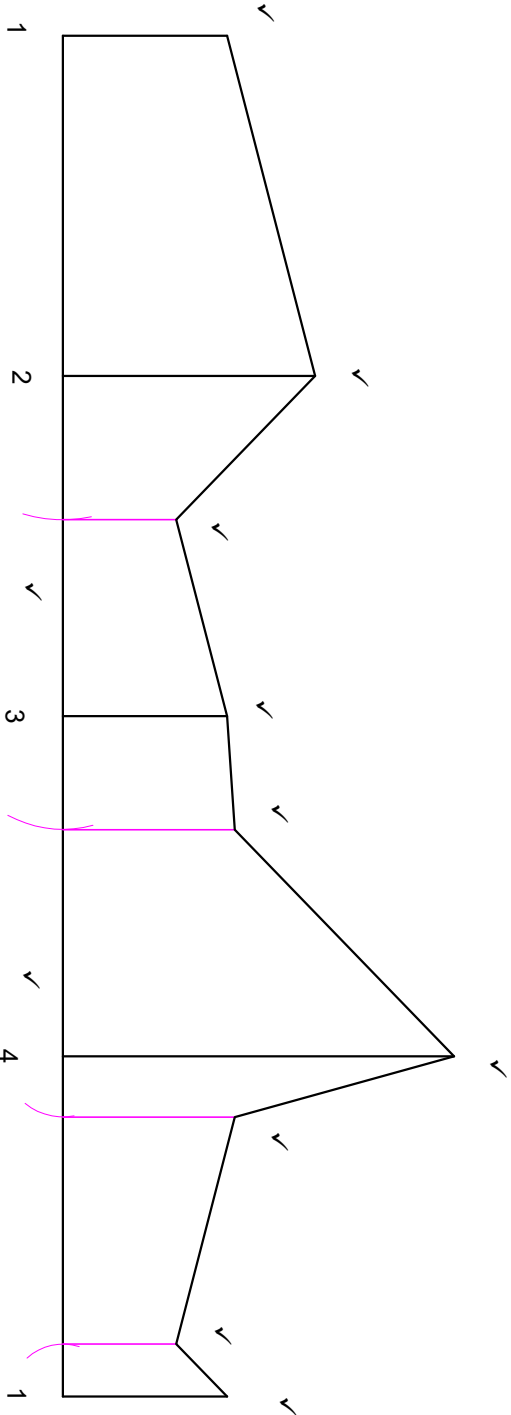
QUESTION 2
INTERPENETRATION
& DEVELOPMENT

The drawings below show the INCOMPLETE Front View, COMPLETE Top View and Right View of a right **SQUARE PRISM** made to fit around a right regular **HEXAGONAL PRISM**.

Draw the following:

- 2.1 the complete Front View clearly showing the line of interpenetration formed between the two solids.
- 2.2 the surface development of the square branch piece.

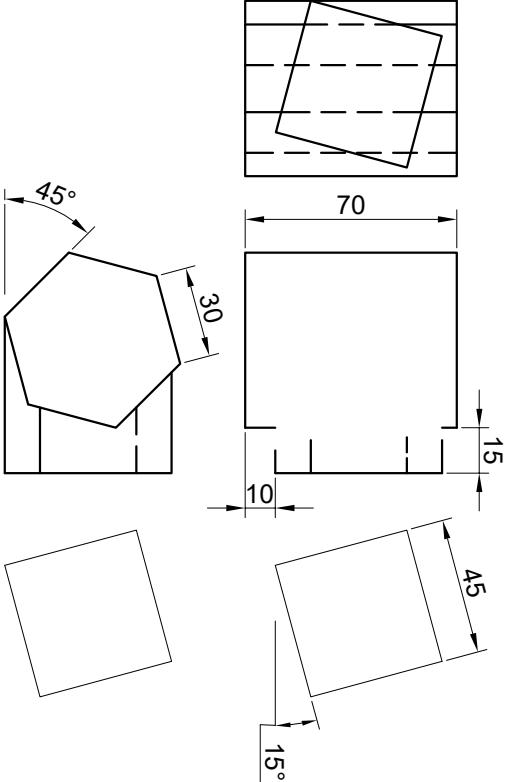
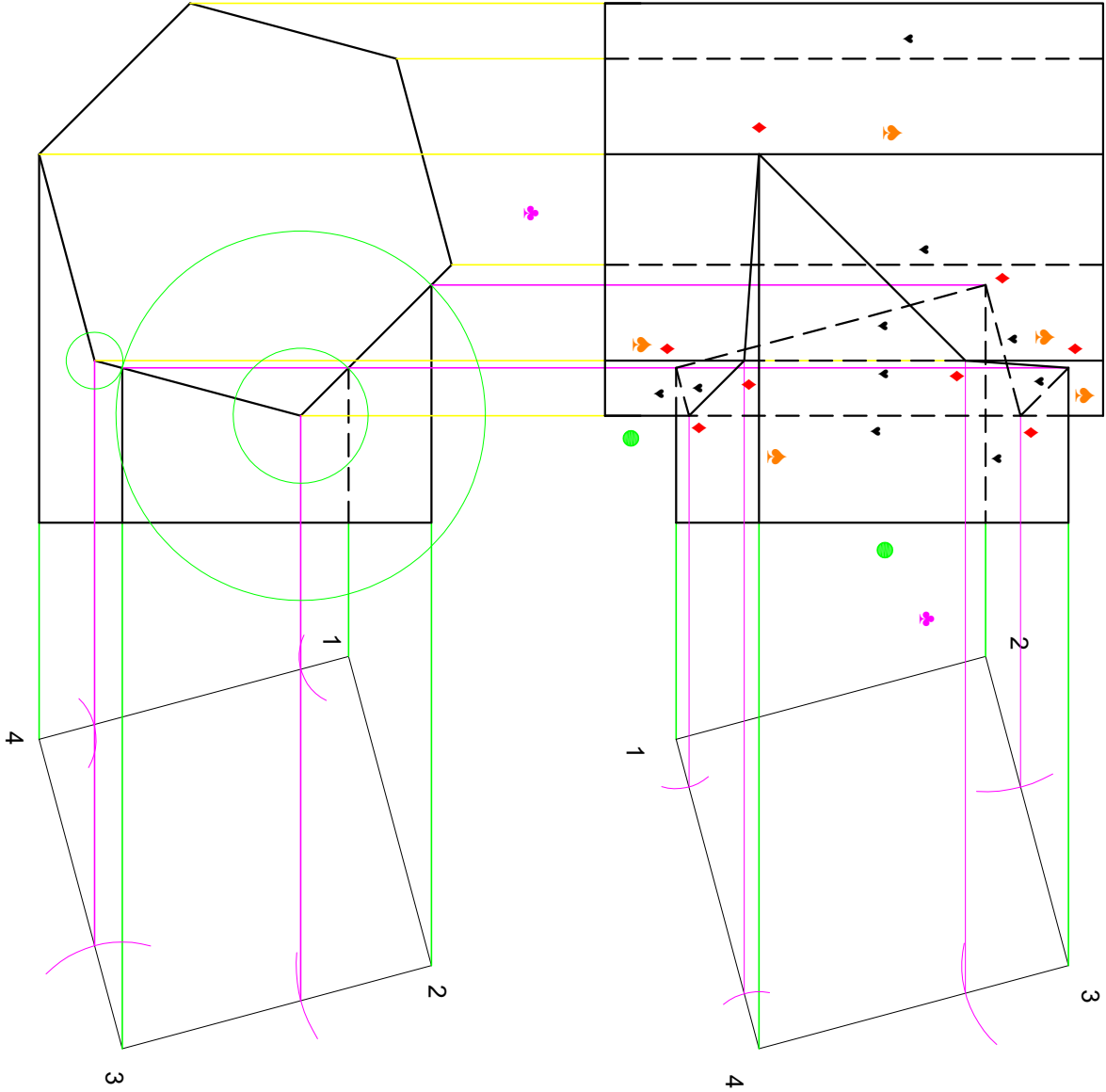
Show all hidden detail.
Show all construction.



Front View:					
Given	●	▲	◆	◆	◆
Hidden Detail					
Interpen					
Solid Lines					
Construct	✱				
Development	✓				
	22	4	10	8	5
		= 4	= 10	= 8	= 5
		= 2	= 11		
	40				

ASSESSMENT CRITERIA

- You will be assessed on your ability to do the following:
- draw the given incomplete Front View 4
 - complete the Front View 23
 - show necessary construction 2
 - draw the development of the square branch piece 11



FV	27	
CON	2	
DEV	11	

40 MARKS

EXAMINATION NUMBER

ANSWER SHEET 2

QUESTION 4

CIVIL
DRAWING

Assessment Criteria

Sectional Elevation

1 Ceiling Battens	2	
2 Wall Plates	2	
3 Ceiling Board	1	
4 Truss Plates	4	
5 Roof Truss	5	
6 Purlins	4	
7 Roof	1	
8 Fascia Boards	2	
9 Sectioned Walls	4	
10 Sectioned Window	5	
11 Floor & Foundation	6	
12 DPC	2	
13 Hatching	9	
14 Doorway	3	
15 Labels	2	

Subtotal	52	
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Floor Plan

16 Walls	7	
17 Hatching	4	
18 Windows	4	
19 Door	3	
20 Ramp	5	
21 Cutting Plane	2	
22 Labels	2	

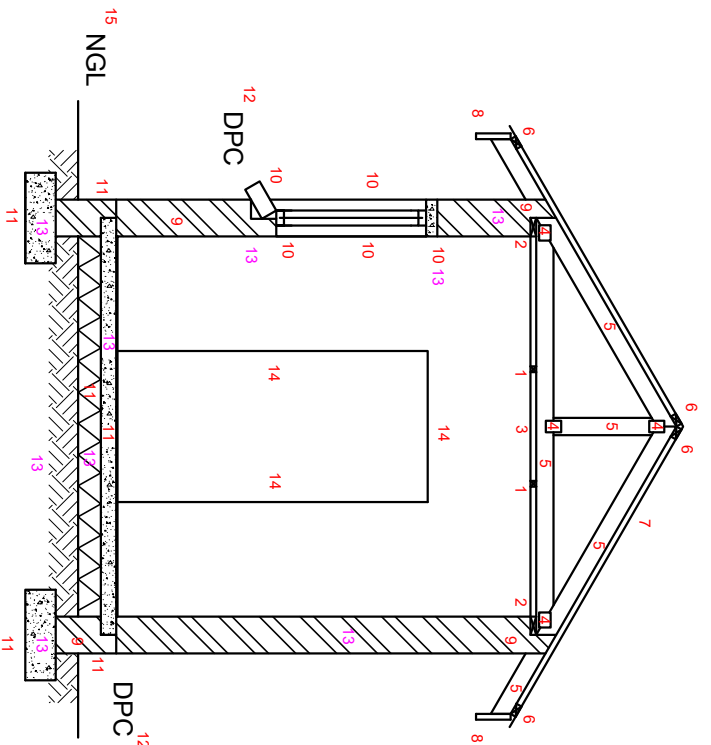
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West Elevation

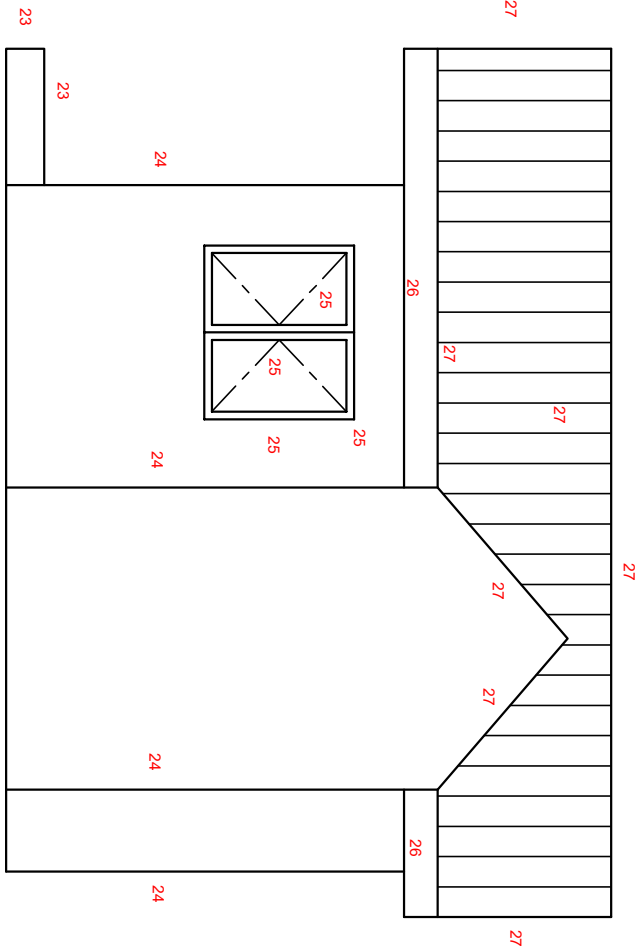
23 Ramp	2	
24 Walls	5	
25 Window	4	
26 Fascia Board	2	
27 Roof	7	
28 Label	1	

Subtotal	21	
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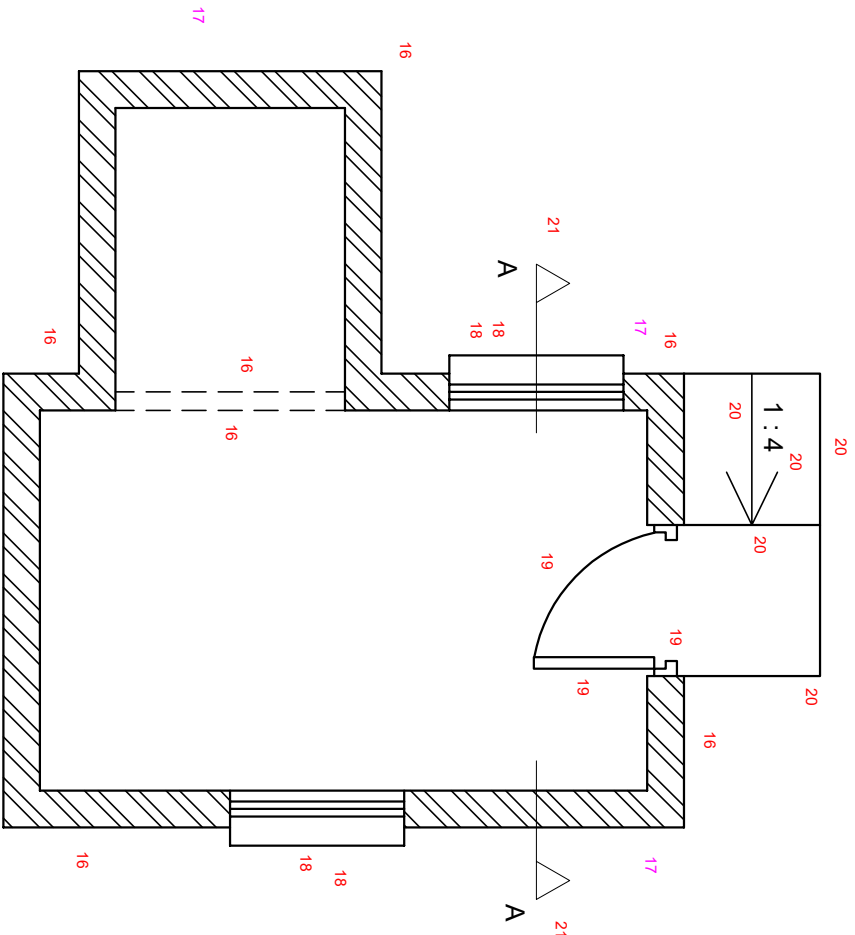
TOTAL	100	
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SECTIONAL SOUTH ELEVATION ON A-A



WEST ELEVATION



FLOOR PLAN
SCALE 1:50

ANSWER SHEET 4

EXAMINATION NUMBER