FURTHER EDUCATION & TRAINING PHASE (FET) ENGINEERING ENGINEERING ENGINEERING ERAPHICS AND DESIGN SBA EXEMPLAR BOOKLET ERADES 10-12



Department: Basic Education REPUBLIC OF SOUTH AFRICA





FOREWORD



The Department of Basic Education has pleasure in releasing a subject exemplar booklet for School Based Assessment (SBA) to assist and guide teachers with the setting and development of standardised SBA tasks and assessment tools. The SBA booklets have been written by teams of subject specialists to assist teachers to adapt teaching and learning methods to improve learner performance and the quality and management of SBA.

The primary purpose of this SBA exemplar booklet is to improve the quality of teaching and assessment (both formal and informal) as well as the learner's process of learning and understanding of the subject content. Assessment of and for learning is an ongoing process that develops from the interaction of teaching, learning and assessment. To improve learner performance, assessment needs to support and drive focused, effective teaching.

School Based Assessment forms an integral part of teaching and learning, its value as a yardstick of effective quality learning and teaching is firmly recognised. Through assessment, the needs of the learner are not only diagnosed for remediation, but it also assists to improve the quality of teaching and learning. The information provided through quality assessment is therefore valuable for teacher planning as part of improving learning outcomes.

Assessment tasks should be designed with care to cover the prescribed content and skills of the subject as well as include the correct range of cognitive demand and levels of difficulty. For fair assessment practice, the teacher must ensure that the learner understands the content and has been exposed to extensive informal assessment opportunities before doing a formal assessment activity.

The exemplar tasks contained in this booklet, developed to the best standard in the subject, is aimed to illustrate best practices in terms of setting formal and informal assessment. Teachers are encouraged to use the exemplar tasks as models to set their own formal and informal assessment activities.

MR'HM MWELI DIRECTOR-GENERAL_ DATE: 1309 (2001 9

DEPARTMENT OF BASIC EDUCATION

ENGINEERING GRAPHICS & DESIGN SCHOOL BASED ASSESSMENT

1. INTRODUCTION

The Engineering Graphics and Design (EGD) School Based Assessment (SBA) comprises of Course Drawings (CDs), Tests and Examinations, which contributes, as prescribed, to each learner's SBA term mark as well as 25% toward each learners' final National Senior Certificate (NSC)/promotional mark.

Although the Practical Assessment Task (PAT) is also a compulsory formal assessment component of EGD, it is essentially the third EGD NSC/promotional examination paper, which contributes 25% towards each learner's final NSC/promotional mark only, and therefore not part of the SBA mark for any of the terms or for the final NSC/promotional SBA mark.

The EGD tasks included in/with this document is not intended for any specific SBA component and are merely examples of EGD tasks, intended to give guidance to EGD teachers when setting their own SBA tasks, or that can be used as tests and examination questions or even as informal Daily Developmental Exercises (DDEs) and CDs.

It therefore remains imperative, as instructed by the EGD CAPS, that every EGD learner must have a grade specific CAPS compliant EGD Textbook, which should be the primary source of DDEs and CDs.

A grade specific CAPS compliant EGD textbooks should also be each EGD learners' primary informative, instructional, referential, preparatory and developmental resource. A CAPS compliant EGD textbook may therefore not be substituted by an EGD workbook/work file or the tasks included in/with this document, as workbooks/work files and the included tasks only have preparatory and developmental value. EGD workbooks/work files and the included tasks may therefore only be used in conjunction with a CAPS compliant EGD textbook and should primarily serve as resources from which teachers can freely source additional SBA tasks and DDEs.

The other primary resource that EGD teachers should regularly refer too or use as an additional source for SBA tasks, are the previous EGD NSC, Exemplar and Pilot examination papers of the **Department of Basic Education (DBE)**, which are all freely available on the DBE's website.

NOTE:

The most common practice implemented by schools that continuously perform very well in EGD is that the learners do as many tasks as possible (3 to 5 different tasks a week), of which most are assessed by using simplified rubrics, and the learners given constructive feedback thereon. For the purpose of this document as well as a common national terminology and understanding, these informal tasks are referred to as Daily Developmental Exercises (DDEs).

2. FORMAT OF EGD SBA TASKS

Even though the included tasks have very similar formats, there are differences in terms of wording, presentation and assessment criteria as the tasks were supplied by various developers. This then implies that there is not an absolute correct format but rather a general format where the wording, given drawings and assessment criteria should be on the right side of the task/drawing sheet with more than enough space for the answer to the left of the given information. Where the given drawings and information requires all the space on the task sheet, e.g. for civil working drawings, mechanical assemblies etc., the wording and assessment criteria should still be on the right side of the sheet.

It is however important that the format of especially test and examination questions should familiarise and prepare learners for the final NSC/promotional examination papers.

The DBE's latest EGD NSC (grade 12) papers should therefore be referred to as best practice examples for the format, i.e. the layout, wording, drawing presentation and assessment criteria, for especially tests and examination questions.

Although the included grade 10 tasks are on A4 task/drawing sheets and the grade 11 and 12 tasks on A3 task/drawing sheets, neither of the grades are restricted to either A4 or A3 task/drawing sheets. **Grade 10, 11 and 12 tasks, especially DDEs and CDs, can therefore**, depending on the size of the answer/drawing, **be done on either A4 or A3 task/drawing sheets**.

NOTE:

When DDEs and CDs are done (sourced) from a textbook, borders and title blocks/panels are not required on the 'clean' A4 or A3 drawing sheets, unless specifically asked as a question or as part of a question or when required by the specific type of task, e.g. a Civil working drawing.

The **learners should rather be encouraged to do as many DDEs as possible**, without unnecessarily burdening them with borders and title blocks/panels. The learner's name, the task number/name and the date of completion must however be clearly indicated in the bottom-right-hand-corner of the 'clean' drawing sheet.

3. EGD SBA REQUIREMENTS

3.1 The minimum SBA requirements for EGD are as follow:

GRADE 10:

- Two tests
- Twelve course drawings
- Mid-year examination

GRADE 11:

- Two tests
- Thirteen course drawings
- Mid-year examination

GRADE 12:

- One tests (See DBE Circular S11 of 2013 and DBE CAPS Errata of December 2013.)
- Fifteen course drawings
- Mid-year examination
- Trail/prelim/preparatory examination

3.2 The weightings of the cognitive levels for EGD SBA tasks are as follow:

The application of BLOOM'S TAXONOMY					
The weighting of the	LOW (Understanding and remembering)	± 30%			
COGNITIVE LEVELS for ALL EGD formal assessment tasks	MEDIUM (Analysing and applying)	± 40%			
	HIGH (Creating and evaluating)	± 30%			

3.3 Programmes of compulsory SBA tasks and the promotion/NSC mark composition

These programmes give a detailed overview of each term's compulsory SBA tasks. ALL the compulsory SBA tasks of a specific term, excluding the PAT, must be recorded during that term and included in that term's reported mark.

NOTE:

• More than one task should be used to obtain each recorded Course Drawing mark.

3.3.1 Grade 10 programme of compulsory SBA tasks

GRADE 10 SBA TASKS								
	TERM 1			TERM 2			TERM 3	
Assessment Tasks & contribution for the term			Assessment Tasks & contribution for the term		Assessment Tasks & contribution for the term			
Course Drawings:• Freehand drawing• Geometrical construction• Ellipse		40%	 Course Drawings: 1st mechanical drawing 2nd mechanical drawing Isometric drawing 		25%	Course Drawings: Solid geometry Descriptive geometry Civil floor plan Civil sectional elevation One-point perspective 		
Test(s)		60%	Mi Pa	id-year examination: oper 1 & Paper 2		75%	Test(s)	60%
TERM 4 Assessment Task • Electrical drawing		Electrical drawing	Fo	or final/	promotional Course Drawing mark	only		

	GRADE 10 PROMOTION MARK COMPOSITION					
	Assessment Tasks		Compulsory contribution			
	ALL tests		30 (7.5%)			
SBA	ALL Course Drawings		30 (7.5%)			
	Mid-year examination: Paper 1 & Paper 2		40 (10%)			
Practical As	ssessment Task (PAT)		100 (25%)			
November (final) examination: Paper 1 (100 marks) & Paper 2 (100 marks)		200 (50%)			
		TOTAL	400			

3.3.2 Grade 11 programme of compulsory SBA tasks

GRADE 11 SBA TASKS								
	TERM 1			TERM 2			TERM 3	
Asses contrib	sment Tasks &			Assessment Tasks contribution for the te	s & rm		Assessment Tasks & contribution for the term	
Course Drav Mechanical a 1 st mechar Isometric c Two-point	Course Drawings: Course Drawings: • Mechanical analytical exercise • 1 st mechanical assembly • Isometric drawing 40% • Two-point perspective 40%			25% Course Drawings: Interpenetration & development Development of transition piece Loci (Helix) Loci (Cam) 2nd mechanical assembly 		40%		
Test(s)		60%	Mi Pa	id-year examination: aper 1 & Paper 2		75%	Test(s)	60%
TERM 4	Assessment	Task		Electrical drawing	Fo	r final/	promotional Course Drawing mark	only

GRADE 11 PROMOTION MARK COMPOSITION						
	Assessment Tasks Compulsory contribution					
	ALL tests	30 (7.5%)				
SBA	ALL Course Drawings	30 (7.5%)				
1	Mid-year examination: Paper 1 & Paper 2	40 (10%)				
Practical As	sessment Task (PAT)	100 (25%)				
November (final) examination: Paper 1 (100 marks) & Paper 2 (100 marks)	200 (50%)				
	TO	OTAL 400				

3.3.3 Grade 12 programme of compulsory SBA tasks

GRADE 12 SBA TASKS						
TERM 1		TERM 2		TERM 3		
Assessment Tasks & contribution for the term		Assessment Tasks & contribution for the term		Assessment Tasks & contribution for the term		
 Course Drawings: 1st mechanical assembly Mechanical analytical exercise Civil sectional elevation Civil floor plan with elevations Civil site plan Two-point perspective 	40%	 Course Drawings: Isometric drawing Solid geometry Interpenetration & development 2nd mechanical assembly 	25%	 Course Drawings: Development of transition piece Loci (Helix) Loci (Cam) Loci (Mechanisms) 3rd mechanical assembly 	25%	
Test(s)	60%	Mid-year examination: Paper 1 & Paper 2	75%	Preparatory examination: Paper 1 & Paper 2	75%	

GRADE 12 NSC MARK COMPOSITION							
	Assessment Tasks Compulsory contribution						
	ALL tests	15 (3.75%)					
SBA	ALL course drawings	30 (7.5%)					
	Mid-year examination: Paper 1 and Paper 2	20 (5%)					
	Trail/prelim/preparatory examination: Paper 1 and Paper 2	35 (8.75%)					
Practical	Assessment Task (PAT)	100 (25%)					
Novembe	er (final) examination: Paper 1 (100 marks) & Paper 2 (100 marks)	200 (50%)					
	ΤΟΤΑ	L 400					

3.4 Descriptions and/or requirements of the SBA tasks

NOTE:

Tasks/questions on content that is beyond the prescribed content of the CAPS, e.g. isometric circle for grade 10 and site plans for grade 11, may not be included/used as SBA tasks.

3.4.1 Course Drawings (CDs)

As EGD is both a knowledge and application/skill-based subject, many DDEs, on the content of each topic and in accordance with the Annual Teaching Plan (ATP), must be done on a regular (daily) basis.

From this **essential developmental process**, **various DDEs** should be **formally assessed and recorded** as part of the **programme of compulsory SBA tasks**. These **assessed and recorded DDEs** will then be **referred to as Course Drawings (CDs)**.

The purpose of the CDs:

- To provide evidence that the prescribed content of each topic has been adequately covered;
- To provide evidence that ALL the learners have been assessed and given sufficient feedback on their acquired knowledge and skills on common tasks of each topic;
- To ensure that **EGD teachers** will be **accountable** towards the learners, their parents/ guardians, the Department of Education and all other stakeholders.

Requirements for Course Drawings (CDs):

 The CDs must come from the normal developmental teaching and learning process of EGD and should therefore be some of the regular (daily) tasks, i.e. the DDEs; NOTE:

CDs may therefore be sourced directly from textbooks.

- Teachers must insure that each CD is each learner's own work; NOTE:
 - It is recommended that a standing rule in every EGD classroom should be that any DDE (task) of a specific topic can be used to contribute to the CD mark of that topic
 - Teachers must then randomly, without prior notification, select various DDEs to be used as CDs. This will put the focus on DDEs instead of CDs, which should encourage learners to do most or all their DDEs. The correct implementation of the practice should ensure that the CDs are each learners' own work.
 - This practice should also ensure the validity of CDs
- ALL the learners must be afforded extended opportunities, within realistic time frames, to attempt to complete, correctly or incorrectly, each of the CDs; NOTE:

Extended opportunities should be within the specific term of the topic as ALL the compulsory SBA tasks of a specific term must be recorded during that term and included in that term's reported mark.

 The recorded CD mark should address all, or most of, the grade-specific content of the topic and it must be of an appropriate higher order of complexity for the specific grade. However, more than one task should be used to obtain the recorded CD mark; NOTE:

It is recommended that **3 to 4 DDEs should be used to obtain the recorded DC mark** for each topic. This should ensure that **all the content** is **covered** within the CD mark.

 To ensure that all the CDs comply with test and examination requirements and standards, all CDs, with the exception of the analytical exercises and the perspective drawing(s), must be tasks that are completely redrawn; NOTE:

Sourcing CDs from textbooks will ensure compliance to this requirement.

 The questions and model answer of ALL the CDs must be in the teacher's working file; NOTE:

If the CD was **sourced from a textbook**, a **copy of the task**, i.e. the question, **and of the model answer** must be placed in the teacher's working file.

- ALL the assessed and recorded CDs of each learner must be in his/her EGD file;
- CDs are compulsory formal assessment tasks that must contribute to the final NSC/ promotion mark;
- Simplified rubrics should be used to assess ALL the CDs;
- It is important to note that the CDs are not tests.

NOTE:

Detailed descriptions of the content requirements of all CDs are on pages 47 to 50 of the CAPS.

3.4.1 Tests

- All the questions of the EGD tests must be of a **similar or higher standard** than the corresponding questions of the **DBE's examination/exemplar papers**;
- The mark allocations must also correlate with the DBE's EGD NSC, Exemplar and Pilot examination paper questions;
- The question or questions for each test must justify a **minimum time allocation of 60 minutes** and a **minimum mark allocation of 50 marks.** Most tests will therefore have to consist of at least TWO questions;
- However, if the **time allocated for a test is not sufficient** for the completion of both questions, the two questions **can be written as two separate tests**, on two or more separate topics, to make up the required 60 minutes and 50 marks.

3.4.2 Examinations

The EGD examination papers must, in terms of format and content, be of a **similar or higher standard than the DBE's EGD NSC, Exemplar and Pilot examination papers**. The **mark allocations** must also be **in-line with the DBE's latest NSC examination papers**.

To ensure the validity of examination papers, **complete previous EGD exam papers**, whether internally or externally set, **may not be used again**. However, individual questions (**only ONE per examination paper**) from previous question papers may, preferably with some changes, be used again.

Format and composition of the final/November EGD Examination Papers

GRADE 10							
PAPER 1 -CIVIL-			PAPER 2 -MECHANICAL-				
(2 hours)				(2 hours)			
In first-angle orthographic projection				In third-angle orthographic projection			
Q 1A	Civil analytical	+ 20%	Q 1	Mechanical analytical	± 20%		
Q 1B	Electrical circuits	± 20%	Q 2	Geometrical construction	± 25%		
0.2	Descriptive geometry		Q 3	Isometric drawing	± 25%		
QZ	and/or Solid geometry	I 23%	Q 4	Mechanical working drawing	± 30%		
Q 3	1-point perspective drawing	± 25%					
Q 4	Civil working drawing	± 30%					
NOT	NOTE : For the June examination , the TWO 2-hour papers may be substituted by ONE 3-hour paper						

	GRADE 11							
	PAPER 1 -CIVIL-		PAPER 2 -MECHANICAL-					
	(3 hours)			(3 hours)				
In first-angle orthographic projection				In third-angle orthographic project	tion			
Q 1A	Civil analytical	± 150/	Q 1	Mechanical analytical	± 15%			
Q 1B	Electrical circuits	± 1370		Loci of a Helix	1 200/			
	Interpenetration and development		QZ	<u>and/or</u> Loci of a Cam	± 20%			
0.2	and/or development of a	+ 20%	Q 3	Isometric drawing	± 25%			
	transition piece	± 2070	Q 4	Mechanical assembly	± 40%			
	and/or Solid geometry			-				
Q 3	2-point perspective drawing	± 25%						
Q 4	Civil working drawing	± 40%						

	GRADE 12						
	PAPER 1 -CIVIL-			PAPER 2 -MECHANICAL-			
	(3 hours)			(3 hours)			
	In first-angle orthographic projectio	n		In third-angle orthographic projec	tion		
Q 1	Civil analytical	± 15%	Q 1	Mechanical analytical	± 15%		
	Interpenetration and development			Loci of a Helix			
0.2	<u>and/or</u> development of a	+ 20%		<u>and/or</u> Loci of a Cam	+ 20%		
QZ	transition piece	1 20 /0		<u>and/or</u> Loci of a point(s) of a	1 20 /0		
	and/or Solid geometry			mechanism			
Q 3	2-point perspective drawing	± 20%	Q 3	Isometric drawing	± 20%		
Q 4	Civil working drawing including	1 450/	Q 4	Mechanical assembly	± 45%		
	electrical features	± 45%					

3.5 Assessment of SBAs

Assessment is an integral part of teaching and learning, and should be done on a regular basis. It is therefore essential that **most DDEs should also be assessed**.

However, to ensure that assessment successfully contributes to the teaching and learning process, it is imperative that **ALL assessment tasks**, whether formal or informal, **must be assessed**, **recorded** and **filed within ONE week** of being submitted/completed.

3.5.1 Course Drawings (CDs)

• A mark out of 10 according to a **simplified rubric** *NOTE:*

The **complete model answer** of each CD must be in the teacher's EGD working file and used as a guideline for obtaining the mark

• or, a mark according to a marking memorandum, converted back to 10

3.5.2 Tests

• Marks allocated according to marking memoranda/marking guidelines

3.5.3 Examinations

• Marks allocated according to marking memoranda/marking guidelines

NOTE:

- Rubrics may not be used to assess tests or examinations;
- The DBE's latest NSC examination paper memos should be referred to as best practice examples for the allocation of marks for test and examination marking memoranda/ marking guidelines

The allocation of $\frac{1}{2}$ (half) marks is therefore strongly recommended as the learners will benefit for each correct line and/or aspect of his/her answer.

- As accuracy is a fundamental and essential component of EGD drawings, a deviation of only 1 mm is permissible on the accuracy of ALL aspects of ALL drawings. However, the principles of 'mark with the mistake' and 'the learner should be given the benefit of the doubt' must also be applied when the required level of evidence of knowledge has been displayed.
- With the exception of the concessions referred to in the DBE's 2017 EGD Examination Guidelines or when instructed to do so, all other drawings or aspects of drawings drawn in freehand should not be assessed.

3.6 Assessment rubrics

PTO for the simplified rubrics!

3.6.1 A simplified RUBRIC for assessing CDs and DDEs

NOTE:

- If the task is a CD, the **complete model answer** of the drawing **must be used** as a guideline for obtaining the mark.
- This RUBRIC may not be used for assessing multi-view Civil or Mechanical drawings.

RUBRIC for the CORRECTNESS of the drawing					
DESCRIPTION for MARK		± PERCENTAGE	MARK		
OUTSTANDING	Error free	100%	7		
MERITORIOUS (VERY GOOD)	- Few errors -	± 85% A distinction drawing	6		
SUBSTANTIAL (GOOD)		± 70% A good 'C' to 'B' drawing	5		
ADEQUATE (SATISFACTORY)	Some errors	± 55% MORE than a 50%	4		
MODERATE (ACCEPTABLE)	(± ½ right and ½ wrong)	± 40% LESS than a 50%	3		
ELEMENTARY(UNACCEPTABLE)	Many errors	± 33% Only a few correct features	2		
NOT ACHIEVED (VERY BAD)	Completely wrong	± 25% & LESS <i>'Something'</i> drawn very wrongly	1		
NON-COMPLIANCE	No work was handed in	Nothing to mark	NC		

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RUBRIC for the **QUALITY** and **NEATNESS** of the drawing

Assess the **consistency** and **quality** of **line work**, **printing/writing**, **dimensioning techniques** and **general neatness** of the drawing.

DESCRIPTION for MARK	GENERAL INDICATORS	± PERCENTAGE	MARK
OUTSTANDING (VERY GOOD)	Very easy to 'read'	80% +	3
ADEQUATE (SATISFACTORY)	'Readable', but could be better	60% +	2
NOT ACHIEVED (VERY BAD)	Difficult to 'read'	50% & LESS	1
NON-COMPLIANCE	No work was handed in	Nothing to mark	NC

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TOTAL

10

EXAMPLES	OF CRITE	RIA		OWN CRITERIA	
CRITERIA	2 VIEWS	3 VIEWS	4 VIEWS	CRITERIA	MARKS
VIEW 1	6	4	3		
VIEW 2	6	4	3		
VIEW 3	-	4	3		
VIEW 4	-	-	3		
BORDER and COMPLETE TITLE BLOCK	1	1	1		
ANNOTATIONS / NOTES / SECTION PLANE	2	2	2		
DIMENSIONS	2	2	2		
PRESENTATION: Planning, Quality and Neatness	3	3	3		
TOTAL	20	20	20	TOTAL	
CALCULATION	÷ 2	÷ 2	÷ 2	CALCULATION	
RECORDED TOTAL	10	10	10	RECORDED TOTAL	10
No work was handed in	NC	NC	NC	No work was handed in	NC

3.6.2 A simplified RUBRIC for assessing MULTI-VIEW Civil working drawings

NOTE:

The total for the OWN CRITERIA could also be out of **30 or 40 or even more**. It is, however, advisable that a total that is easily convertible back to 10 should be used.

3.6.3 A simplified RUBRIC for assessing MULTI-VIEW Mechanical working drawings

EXAMPLES	OF CRITEI	RIA		OWN CRITERIA	
CRITERIA	2 VIEWS	3 VIEWS	4 VIEWS	OWN CRITERIA	MARKS
VIEW 1	6	4	3		
VIEW 2	6	4	3		
VIEW 3	-	4	3		
VIEW 4	-	-	3		
BORDER and COMPLETE TITLE BLOCK	1	1	1		
SECTION PLANE(S)	1	1	1		
PROJECTION SYMBOL	1	1	1		
DIMENSIONS	2	2	2		
PRESENTATION: Planning, Quality and Neatness	3	3	3		
TOTAL	20	20	20	TOTAL	
CALCULATION	÷ 2	÷ 2	÷ 2	CALCULATION	
RECORDED TOTAL	10	10	10	RECORDED TOTAL	10
No work was handed in	NC	NC	NC	No work was handed in	NC

NOTE:

The total for the OWN CRITERIA could also be out of **30 or 40 or even more**. It is, however, advisable that a total that is easily convertible back to 10 should be used.

3.7 Topics & cognitive analysis grids

ENGINEERING GRAPHICS AND DESIGN GRADE ____ COURSE DRAWING TOPICS & COGNITIVE ANALYSIS

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CI				_									<u> </u>				S			±30	0%	±4()%	±30)%	
COURSE DRAWING	ANALYTICAL & VISUALISATION	INSTRUMENT DRAWINGS	FREE-HAND DRAWING	GEOMETRICAL CONSTRUCTION	SCALES	DESCRIPTIVE GEOMETRY	SOLID GEOMETRY	MECHANICAL DRAWING	CIVIL DRAWING	ISOMETRIC DRAWING	PERSPECTIVE DRAWING	ELECTRICAL DIAGRAMS	NTERPENETRATION & DEVELOF	TRANSITION PIECE	LOCI OF A HELIX	LOCI OF A CAM	DCI OF POINTS ON MECHANISM	DESIGN PROCESS	CAD	G Gr 10 UNDERSTAND		Gr 11 ANALYSING	D ADVANCE APPLYING	E Gr 12 CREATING	EVALEX EVALUATING	TOTAL
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ENGINEERING GRAPHICS AND DESIGN

BLOOMS REVISED TOPICS TAXONOMY ±40% ±30% ±30% INTERPENETRATION & DEVELOPMENT **-OCI OF POINTS ON MECHANISMS** UNDERSTANDING **GEOMETRICAL CONSTRUCTION** ANALYTICAL & VISUALISATION EVALUATING RECALLING ANALYSING **INSTRUMENT DRAWINGS** PERSPECTIVE DRAWING CREATING **DESCRIPTIVE GEOMETRY** ELECTRICAL DIAGRAMS **APPLYING** *MECHANICAL DRAWING* FREE-HAND DRAWING **ISOMETRIC DRAWING FRANSITION PIECE** DESIGN PROCESS SOLID GEOMETRY **CIVIL DRAWING** LOCI OF A HELIX LOCI OF A CAM TOTAL SCALES CAD ADVANCE COMPLEX 9 Grade 11 42 BASIC Grade ' Grade ' TESTS LOW MED HIGH EASY MED DIFF. ✓ THE APPLICABLE TOPIC(S) FOR EACH CD MARK DISTRIBUTION 1 2 3 4 5 6 7 8 9 10 11 12 COMBINED TOTAL FOR ALL COURSE DRAWINGS

GRADE ____ TEST TOPICS & COGNITIVE ANALYSIS

NOTE:

- The examples of the grade 10 EGD SBA tasks, which are all presented on A4 task/drawing sheets, are contained in the separate A4 annexure.
- The examples of the grade 11 and 12 EGD SBA tasks, which are all presented on A3 task/drawing sheets, are contained in the separate A3 annexure.

ENGINEERING GRAPHICS & DESIGN



SCHOOL-BASED ASSESSMENT

GRADE 10 EXAMPLES

GRADE 10 EXAMPLES

QUESTIONS

ENGINEERING GRAPHIC: AND DESIGN	FREEHAND ErechanD Given: FLOOR PLAN Instruction: Use the space provided and redraw the given size Instruction: Use the space provided and redraw the given size	GRADE 10 FREEHAND	
		ELOOR PLAN	

ENGINEERING GRAPHICS AND DESIGN									GRADE 10 ORTHOGRAPHIC GRID		
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ENGINEERING GRAPHICS AND DESIGN	GEOMETRICAL CONSTRUCTION Given: A view of a TENSION PLATE The position of point A on the drawing sheet	Instruction: Duplicate the given view according to scale 1 : 2. • Complete the title block.	850 825 R84 876 876 876 838 850 R18 R46 R18 R46 R18 R46 R18 R46 R46 R46 R46 R46 R46 R46 R46	GRADE 10 GEOMETRICAL CONSTRUCTION	



ENGINEERING GRAPHICS AND DESIGN	GIVEN: A pictorial drawing of a BRACKET.	INSTRUCTIONS: Do not copy this drawing. Convert the drawing into third-angle orthographic projection.	 Draw the following views : A sectional front view on AA. A top view. A right view. Show ALL hidden detail. 	GAT 42 mm DIEP	A 200 A 400	GRADE 10 MECHANICAL		

ENGINEERING GRAPHICS AND DESIGN	GIVEN: A pictorial drawing of a BRACKET.	INSTRUCTIONS: Do not copy this drawing. Study the drawing carefully then convert the drawing into THIRD-ANGLE ORTHOGRAPHIC PROJECTION.	 Draw the following views : A sectional front view on AA. A top view. A right view. Show ALL hidden detail. 	20 20 05 05 05 05 05 05 05 05 05 0	GRADE 10 MECHANICAL	
ш	0 4					







ISOMETRIC Given: • The front and	ENGINEERING GRAPHICS AND DESIGN
top view of a PAPER WEI • Point A as the	HT in third angle ortographic projection. starting position
Instruction: Draw according to • Draw an ison top- and left • Show all the • No hidden de	scale 1 : 1 the following: tric view of the PAPER WEIGHT so that the front-, ews will be visible. scessary constructions ill is needed.
	120 120
	02
	GRADE 10 ISOMETRIC

 $\overset{\mathsf{A}}{\succ}$

	ightarrow 4
GRADE 10 ISOMETRIC	
8	
 Instructions: Use scale 1 : 1 and convert the orthographic views of the machine piece into an isometric drawing. Make A the lowest point of the drawing. No hidden detail is required. 	
ISOMETRIC DRAWING Given: • The front view and top view of a machine piece • The posision of A on the drawing sheet	
ENGINEERING GRAPHICS AND DESIGN	

ENGINEERING GRAPHICS AND DESIGN
GIVEN: The top view and front view of a right regular hexagonal pyramid is shown below. The pyramid is cut by a cutting plane VT.
INSTRUCTIONS: Draw the following views of the pyramid: 1. The given front view 2. The sectional top view 3. The sectional right view 4. The true shape of the cut surface.
Note: Show All hidden detail [32]
GRADE 10 SOLID GEOMETRY

ENGINEERING GRAPHICS AND DESIGN	ntagonal prism with a cutting plane.	ormation and draw to scale 1 : 2 the ew. Then project: nd the left view with the section ng the true shape of the sectioned	struction ^s den detail	Egi	<i>پ</i> ر	GRADE 10 SOLID GEOMETRY	
SOLID GEOMETRY Given: The front view	a right regular pe	Instruction: Use the given info sectioned front vi • the top view an • the view show	NOTE: Show ALL con Show ALL hid				

ENGINEERING GRAPHICS AND DESIGN	GIVEN: The front view of a right regular hexagonal prism is shown below. The prism is cut by a cutting plane VT.	Instructions: Draw the following views of the prism: • The given front view • The sectional top view	Note: Show All hidden detail [32]	X Y Y	GRADE 10 SOLID GEOMETRY	

ENGINEERING GRAPHICS AND DESIGN	✓GIVEN: The front view of a right regular hexagonal prism of 32 mm base edge that has been cut by an inclined plane AB.	INSTRUCTIONS: Draw the following views of the prism: • The given front view • The complete top view • The true shape of the cut surface	Show all necessary construction and hidden detail.	GRADE 10 SOLID GEOMETRIE	



ENGINEERING GRAPHICS AND DESIGN	DESCRIPTIVE GEOMETRY Given: The front view and top view of a crane frame with four anchor crane frame with four anchor crane frame with four anchor cables Instruction: Determine through projection the true length of cable d the HP Determine by means of the HP Determine by means of the true angle of cable a the true angle of cable a the true angle of cable a with the VP Project a left view of the crane frame with the four anchor cables	GRADE 10 DESCRIPTIVE GEOMETRIE	
×-			
	×		33




ENGINEERING GRAPHICS AND DESIGN	 GIVEN: An incomplete view of a section through a foundation, slab and load-bearing walls of a basic structure. There is no hatching detail on the view. In the given space, copy, to scale 1:20, the complete section through the given foundation, a slab and load-bearing walls of the structure. Your drawing must include: • All hatching detail according to SANS 10143. The foundation and wall dimensioned. The drawing labelled. 	• The scale used.	GRADE 10 CIVIL	
240 100 240	an incomplete sectional elevation Scale 1:20			

1000 1000	ENGINEERING GRAPHICS AND DESIGN
	 GIVEN: The incomplete floor plan of the outer perimeter of a new storage room, showing the position of the windows and the door. 2) The incomplete foundation; wall and slab detail. 3) The profile of the door frame.
	 INSTRUCTIONS: Using instruments, draw to scale 1 : 50 and in first-angle orthographic projection the following: 1) The complete plan 2) The sectional elevation on the cutting plane A-A. Show the foundation to slab detail.
400 2000 400	Note: The drawing must comply with the SANS 10143.
INCOMPLETE FLOOR PLAN	The following must be included on your drawing: 1) ALL hatching detail 2) The door
230 10 10 10 10 10	 7) 1 V/O window 4) Room designation and grano floor finish 5) The cutting plane labeled A-A 6) ALL labels 7) Labels both views.
INCOMPLETE FOUNDATION; DOOR FRAME PRC	GRADE 10 CIVIL
37	

	ENGINEERING GRAPHICS AND DESIGN	GIVEN: Two views of a simple house and the information needed to draw a single-point perspective drawing. PP - Picture Plane HL - Horizon Line GL - Ground Line GL - Ground Line SP - Station Point SP - Station Point INSTRUCTIONS: Complete the perspective drawing. • Align the drawing sheet with the horizon line (HL) • Locate and label the vanishing point • NO hidden detail is required	Show ALL necessary construction	GRADE 10 COURSE DRAWINGS PERSPECTIVE
38		ᆋ		GL

ENGINEERING GRAPHICS AND DESIGN	PERSPECTIVE Given • The front view and top view of a house • The perspective layout Instruction: Use the given information and make a neat one-point perspective drawing of the house.	GRADE 10 PERSPECTIVE	
	윤	ال ال ال ال	3



ENGINEERING GRAPHICS AND DESIGN	GIVEN: An incomplete circuit diagram where the symbols have been replaced by numbers. A table of symbols to be used to complete the	diagram. INSTRUCTIONS: Re-draw the circuit and replace the numbers with the correct symbol for the component.	The components are: 1. Battery 2. Resistor	 LED Voltmeter Switch Motor Connection 		GRADE 10 ELECTRICAL	
ABLE OF SYMBOLS			•				

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	ENGINEERING GRAPHICS AND DESIGN		GIVEN: A simple electrical circuit with TWO lamps, a LED, a switch and TWO cells.	INSTRUCTIONS:	 In neat <i>freehand</i> and good proportion convert the simple circuit into a schematic circuit diagram 	 Use the correct symbol for each of the components. 						GRADE 10 FI FCTRICAL		
		(1, 1, 5, V) + (1, 1, 5, V) + (0)												
(0)	SYMBOL	\bigotimes												
OF COMPONENTS	COMPONENT	Ð		(1,5 v + (0)	Œ									
SCHEDULE	NAME	LAMP (LIGHTING)	SWITCH	CELL	LED									

GRADE 10 EXAMPLES

MODEL ANSWERS

ENGINEERING GRAPHICS & DESIGN



SCHOOL-BASED ASSESSMENT EXAMPLES

GRADE 10 MODEL ANSWERS

	45
GRADE 10 FREEHAND	
Instruction: Use the space provided and redraw the floor plan in freehand according to the diven size	
FREEHAND Given: FLOOR PLAN	
ENGINEERING GRAPHICS AND DESIGN	



ENGINEERING GRAPHICS AND DESIGN	 CONSTRUCTION DRAWING Given: Given: Reference points and lines Instructions: a Construct an elips through A, B, C and D. C and D. C cand D. C cand D. C construct an elips through A, B, C and D. C and D. C construct an elips through A, B, C and D. C and D. C construct an elips through A, B, C and D. C construct an elips through A, B, C and D. C construct an elips through A, B, C and D. C and D. C construct an elips through A, B, C and D. C and D. C construct an elips through A, B, C and D. C construct an elips through A, B, C and D. C construct an elips through A, B, C and D. C and D. C and D. C construct a regular hexagon using J as the centre point and side lengths = 9mm. Two sides has to be horizontal. P Tint the following in pencil between the given guide lines beneath the drawing: "EGD WHALE" NDATE: C ALL printing and line work to be done in pencil. 	GRADE 10 ELLIPS	
		EGD WHALE	47













	ENGINEERING GRAPHICS AND DESIGN	ISOMETRIC DRAWINGGiven:The front view and top view of a machine pieceThe posision of A on the drawing sheet	 Instructions: Use scale 1 : 1 and convert the orthographic views of the machine piece into an isometric drawing. Make A the lowest point of the drawing. No hidden detail is required. 		GRADE 10 ISOMETRIC		
						\rightarrow <	
54							

ENGINEERING GRAPHICS AND DESIGN	GIVEN: The top view and front view of a right regular hexagonal pyramid is shown below. The pyramid is cut by a cutting plane VT. INSTRUCTIONS: INSTRUCTIONS: Draw the following views of the pyramid: 1. The given front view 3. The sectional top view 3. The sectional right view 4. The true shape of the cut surface. Note: Show All hidden detail 2. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	GRADE 10 SOLID GEOMETRY		
		τ, ας τη Γ	32 32	
×		Y FRONT VIEW TOP VIEW		
			5	5



ENGINEERING GRAPHICS AND DESIGN	GIVEN: The front view of a right regular hexagonal prism is shown below. The prism is cut by a cutting plane VT.	Instructions: Draw the following views of the prism: • The given front view • The sectional top view	Note: Show All hidden detail [32]	Addition of the second	GRADE 10 SOLID GEOMETRY	
				ION. 29 ION. 20 ION. 2		

8	ENGINEER And	RING GR	APHICS
Ř	GIVEN: The front vie hexagonal pri edge that ha inclined plane	w of a righ sm of 32 as been cu AB.	ıt regular mm base ıt by an
	INSTRUCTIOI Draw the foll prism: • The given fr • The complet • The true sha	NS: lowing view ont view te top view	s of the t surface
	Show all ne and hidden de	cessary co tail.	nstruction
	AL AND X		P B A
	B Solid	RADE 10) GEOMETF	E E



ENGINEERING GRAPHICS AND DESIGN	DESCRIPTIVE GEOMETRY Given: The front view and top view of a crane frame with four anchor cables Instruction: Determine through projection the true length of cable d the HP Determine by means of construction: the HP Determine by means of construction: the true length of cable a with the VP Project a left view of the crane frame with the four anchor cables	GRADE 10 DESCRIPTIVE GEOMETRIE		
×		26.39° 11	h	

ENGINEERING GRAPHICS AND DESIGN AND DESIGN CIVIL AREA & PERIMETER Given: The profiles of the floor plans of three houses Instruction: Instruction: • Determine the floor area of each house and the perimeter of the outside walls • Show all your calculations and neatly print the answers in the tabel below NOTE: The total area of a dwelling includes the outside walls and not only the floor area of the rooms				GRADE 10			
	PERIMETER / OMTREK (m)	1 = 13+8+4+2+9+6	= 42 m	2 = 13+6+3+2+4+2+6+6	= 42 m	3 = 4 + 3 + 7 + 3 + 4 + 6 + 4 + 3 + 7 + 3 + 4 + 6	= 54 m
	AREA / OPPERVLAKTE (m²)	1 = $(13 \times 6) + (4 \times 2) = 78 + 8$	$= 86 \text{ m}^2$	2 = (13 x 6) + (4 x 2) = 78 + 8	= 86 m²	3 = $(6 \times 4) + (7 \times 6) + (6 \times 4)$ = $24 + 42 + 24$	= 90 m²
		· · · · ·				-	61



$\label{eq:product} \begin{array}{c} \end{tabular} $	ENGINEERING GRAPHICS AND DESIGN GIVEN: An incomplete view of a section through a foundation, slab and load-bearing walls of a basic structure. There is no hatching detail on the view.	In the given space, copy, to scale 1:20, the complete section through the given foundation, a slab and load-bearing walls of the structure.	 Your drawing must include: All hatching detail according to SANS 10143. The DPC and the NGL labelled. The foundation and wall dimensioned. The drawing labelled. The scale used. 	GRADE 10 CIVIL	
	Image: wide wide wide wide wide wide wide wide	AN INCOMPLETE SECTIONAL ELEVATION SCALE 1:20		SECTIONAL VIEW A-A SCALE 1:20 FOUNDATION. WALLS. SLAB 23	HATCHING 11 LABELS 4 TOTAL 38

ENGINEERING GRAPHICS AND DESIGN	4 2 0 0 1 0 4 1 1 5 4 2 0 0 1 0 0 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1	GRADE 10 CIVIL	
	MARK ALLOCATION SECTIONAL ELEVATION FOUNDATION/WALL/FLOOR HATCHING LABELS TOTAL TOTAL WALLS/DOOR/WINDOW HATCHING CUTTING PLANE WALLS/DOOR/WINDOW HATCHING CUTTING PLANE LABELS TOTAL	L	
	errore and the second s		
64			







3	TABLE OF	SYMBOLS	ENGINEERING GRAPH AND DESIGN	S
	۶Ż		GIVEN: An incomplete circuit diagram whe symbols have been replaced by numbe A table of symbols to be used to compl	e the s. the the
	٤		diagram. INSTRUCTIONS: Re-draw the circuit and replace the nu with the correct symbol for the component	mbers
		•	The components are: 1. Battery 2. Resistor	
E			 LEU Voltmeter Switch Motor Connection 	[15]
			MARK ALLOCATION CORRECTNESS 8 NEATNESS 6	
			FREEHAND 1 TOTAL 15	
			GRADE 10 ELECTRICAL	

	ENGINEERING GRAPHICS AND DESIGN		GIVEN: A simple electrical circuit with TWO lamps, a LED. a switch and TWO cells.	INSTRUCTIONS:	 In neat <i>freehand</i> and good proportion convert the simple circuit into a schematic circuit diagram 	 Use the correct symbol for each of the components. 						GRADE 10 ELECTRICAL		
		(1,5) + $(1,5)$ + (0)								MARK ALLOCATION CORRECTNESS 8 NEATNESS 6	FREEHAND 1 TOTAI 15			
	SYMBOL	\otimes									•			
OF COMPONENTS	COMPONENT	Ð	-	(1,5 v + (C)	Œ				>)	
SCHEDULE	NAME	LAMP (LIGHTING)	SWITCH	CELL	LED				<u>→</u>					69

ENGINEERING GRAPHICS & DESIGN



SCHOOL-BASED ASSESSMENT

GRADE 11 EXAMPLES

APHICS N		1	-	1	1	1	-	-	1	1	-	1	2	2	-	1	-	2	7	7	5	4	30	-06-2015	-06-2015	DATE	JIDE	1		
ERING GR	ANSWERS																				$\left \right\rangle$		TOTAL	Magaret 12	Magaret 11	BY	TICAL GI	SCALE 1:		
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	QUESTIONS	rawing approved?	o manufacture the vertical g	ve been made to the drawir	r the last revision?	sible for?	or the drawing?	rawing?	mber?	sponsible for the design?	was used?				of hole A?	2	12	f rib D?	n at E?	n at F?	the bottom of the page drate convention of a bearing	the bottom of the page dra the orthographic system us		Material changed	Centre points char	REASON	2009	î No. 1569-GC-J	R DESIGNS	T 1985
		what date was the d	at material is used to	v many revisions hav	at was the reason fo	at was Peter respon	at scale was used fo	at is the title of the d	at is the drawing nur	ich Company was re	at drawing program	at is view 1 called?	at is view 2 called?	at is view 3 called?	at is the dimension o	at is feature B called	at is feature C called	at is the thickness of	ermine the dimensio	ermine the dimensio	he space provided at thand the symbol for	he space provided at shand the symbol for		В	4	REVISION No.	AUTOCAD	DRAWING	JANCO	ES
	E views	d a table not been On	ЧМ	neatly Hov	I refer to le block.	[30] Wh	ЧМ	ЧМ	ЧМ	ЧМ	ЧМ	ЧМ	ЧМ	ЧМ	ЧМ	Wh	4M	4/	Det	Det	In th	In th						09-06-2015	08-06-2015	05-06-2015
TICAL (MECHANICAL)	led drawing showing THRE	rtical guide, a title block an stions. The drawing has r	d to the indicated scale.	tions: :te the tab l e be l ow by	ing the questions, which al												01 		52 9			- - -		VIEW 3			herwise stated	Peter	Shawn	Magaret
ANALY	Given: A detai	of a ve of que:	prepare	Instruc Comple	answer the acc		40												_ 1			_					ii to be 5mm unless ot	Approved by	Checked by	Drawn by
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100	82	ج							\		4 HOLES] (/ 120%		012				Ø16		VIEW 2			NOTE: All dimensions		Material	Required
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18 22 19 12 11 12 11 13 12 13 13 13 13 13 13 11 14 11 15 13 15 13 16 10 10 10 11 11 12 13 13 13 13 14 Marteria 0.128/3 Marteria 0.128/3 14 10 13 10 14 10 15 10 16 10 17 11 18 10 19 10 10 10 11 11 11 11 12 12 13 13 14 10 15 10 16 10 17 11 18 10 19 10 10 10 11 10 12 10 13 10 14 10	Image: state of the state	MECHANICAL ANAL MEGANIES ANALI	Print the title "LOCKING DEVICE" in the Title block. Drukskryf die titel "SLUITMEGANISME" in die Titelblok.	Name the system of projection and draw the projection symbol Noem die projeksiesisteem en teken die projeksiesimbool	(Including this one), how many times has the drawing been revised? (Die een ingesluit), hoeveel keer is die tekening hersien?	What is the order number? Wat is die bestelnommer?	This type of drawing is: (Tick only one correct answer) Hierdie tipe tekening is: (Kies slegs een korrekte antwoord)	State the type of material used for manufacturing Meld die tipe matriaal wat vir vervaardiging gebruik is	What feature does (f) represent? Watter kenmerk stel (f) voor?	What is the size of feature (e)? Wat is die grootte van kenmerk (e)?	What feature does (g) represent? Watter kenmerk stel (g) voor?	What feature does (h) represent? Watter kenmerk stel (h) voor?	What is the radius of undercut (k)? Wat is die radius van insnyding (k)?	Which views of the "LOCKING DEVICE" is shown? Watter aansigte van die "SLUITMEGANISME" word getoon?	What is the size and lenght of the external thread? Wat is die grootte en lengte van die eksterne skroefdraad?	Calculate the following dimensions Bereken die volgende afmetings														
8 2 1 1 1	01 1 1 1 010 1 1 1 010 1 1 1 010 1 1 1 010 1 1 1 010 1 1 1 010 1 1 1 010 1 1 1 010 1 1 1 010 1 1 1 010 1 1 1 1 010 1 1 1 1 1 010 1		.	5	m	4	5	9	7	∞	ത	10	11	12	13	14		_												
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Daily Developmental Exercises Daaglikse Ontwikkelingsoefeninge





RING GRAPHICS D DESIGN	GRADE 11 SE DRAWINGS VICAL ASSEMBLY	
ENGINEEF	COUR	
ΈT		
ANSWER SHE		

IGINEERING GRAPHICS AND DESIGN	Y DRAWING led isometric drawing of the parts of a poort bracket, showing the position of ellative to all the others. it views of each of the parts of the poort bracket. 3 12 the following views of the arts of the vertical support bracket: ctional front view on A-A as seen arts of the vertical support bracket: ctional front view on A-A as seen arts of the vertical support bracket. conding the centre line of the assembly on the top view of the support bracket. v of the the assembly on the top view of the support bracket. puele. arts Comply with the guidelines in the SANS <i>10111</i> . Owing feature to the drawing: plane. Label it A A. EE faces of the M22 nut and ALL construction.	PARTS LIST	QUANTITY MATERIAL	1 CAST IRON	1 MILD STEEL	1 BRASS	1 CAST IRON	1 MILD STEEL	1 SPRING STEEL	1 MILD STEEL
и Ш	ASSEMBL GIVEN: • The explod vertical surple • Orthograph vertical surple • Orthograph • Orth		PART	1. SUPPORT BRACKET	2. SHAFT	3. BUSH	4. PULLEY	5. KEY	6. WASHER	7. M44 NUT
M44		e O					.1 1. NO		EXPLODED ISOMETRIC	
	PULEY HEV KEV KEV	021			SHAFT					
				- 108 - 74 -	SUPPORT	BRACKET				

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ENGINEERING GRAPHICS AND DESIGN	GRADE 11 COURSE DRAWINGS MECHANICAL ASSEMBLY	
ANSWER SHEET		

MECHANICAL ASSEMBLY	 Given: The exploded isometric drawing of the parts of a pipe clamp assembly, showing the position of each part relative to all the others Orthographic views of each of the parts of the pipe damp assembly Orthographic views of each of the parts of the pipe damp assembly. Instructions: Answer this question on page 5. Answer this question on the assembled parts of the pipe clamp assembly. A sectional front view on cutting plane A-A, as seen from the direction of the arrow shown on the exploded isometric drawing. The cutting plane, which passes vertically through the centre of the assembly. A.1 A sectional front view on the guidelines contained in the SANS 10111. The left view ALL drawing must comply with the guidelines contained in the SANS 10111. NOTE: Show THREE faces and ALL the necessary construction of the M10 bolt in the front view. Mote detail is required. NO hidden detail is required. 		PARTS LIST	PART QUANTITY MATERIAL	1 BASE 1 CAST IRON 2 BASE CLAMP 1 CAST IRON	3 BUSH 1 BRASS	4 WASHER 1 MILD STEEL	5 M10 BOLT 1 MILD STEEL	ENGINEERING CC www.ahwengineering.co.za	PIPE CLAMP	ALL DIMENSIONS ARE ALL UNSPECIFIED
		BUSH [3]			WASHER [4]			7 M10		M10 BOLT [5]	
	<figure></figure>							Q	MEW.	FRONT	EXPLODED ISOMETRIC DRAWING







 ISOMETRIC Given: The figure shows a support drawn in first angle orthographic projection. Instructions: - Do not copy or draw the given views - Draw a neat isometric drawing of the support. NOTE: - The lowest point of the drawing is at A. IsoMETRIES Gegee: Die figuur toon 'n steunplaat wat in eerstehoekse ortografiese projeksie geteken is. Instruksies: - Teken 'n netjiese isometriese tekening van die steunplaat. Die laagste punt van die tekening is by punt A. 		
	ightarrow <	

ISOMETRIES Gegee: Die figuur toon diie voor en bo-aansig van 'n MODEL.	Instruksie: Teken volgens skaal 1 : 1 die Isometriese tekening van die model. Gebruik punt P as verwysing ISOMETRIC	Given: The figure show the front and top view of a MODEL.	Instruction: Draw according to scale 1 : 1 the Isometric drawing of the model. Use point P as reference.		
				ightarrow ۵	
				FRONT VIEW VOORAANSIG	



	PERSPECTIVE Given: The views of a dwelling as well as all other information needed for the completion of a perspective drawing.
	Instructions: Using the information on this worksheet, draw a two-point perspective drawing of the dwelling. Note the following: - Use drawing instruments - Label the vanishing points - Show all necessary construction.
	PERSPEKTIEF Gegee: Die aansigte van 'n woonhuis asook alle ander besonderhede vir die voltooiing van 'n perspektieftekening.
	Instruksies: Gebruik die inligting op die werksvel om 'n tweepunt- perspektieftekening van die woonhuis te voltooi. Let wel: - Gebruik tekeninstrumente - Bepaal en benoem die verdwynpunte - Toon alle nodige konstruksies.
+ to	



	nventions, a title								2					2	2	2	5	7	r	n	m	e	L 32					
	earing wall, questions on convention to the indicated scale.	ns, which all refer to the accompanying drav	ANSWERS	FOUNDATION	DAMP-PROOF COURSE	GROUND LEVEL	PLASTER BRICK	MINDOWSILL	COMPACTED HARDCORE	UNDISTURBED EARTH	WINDOWGLASS	LINTEL	FINISHED FLOOR LEVEL						view and top view of the SABS 0143	view and top view of the SABS 0143	ool for the north point according to	house in square metres.	TOTA	× 10500 × .	NEW GUEST	10500		
ALYTICAL (CIVIL)	en: etailed drawing of a section through the substructure of a load-br et and a table of questions. The drawings have not been prepared	tructions: mplete the table below by neatly answering the questions, which panel.	QUESTIONS				With reference to the detailed drawing of a continue the	the substructure of a load-bearing wall and a window, link the	alphabetic letter on the drawing with the correct component in the correct component in					2 What does the abbreviation MH stand for?	What does the abbreviation IE stand for?	What does the abbreviation RE stand for?	5 What does the abbreviation B/L stand for?	What does the abbreviation WC stand for?	, In the space provided below, draw in neat freehand, the front v convention for a bath.	In the space provided below, draw, in neat freehand, the front convention for a kitchen sink.	In the space provided below, draw, in neat freehand, the symb SABS 0143.	0 in the space below, determine the total area of the new guest l		NSWER 10 how ALL calculations.		005¥	Ť	
AN 7. In the space provided below, draw	in neat freehand, the front view and Gi top view of the SABS 0143 A convention for a bath.								8. In the space provided below, draw,	In heat reenand, the iron view and top view of the SABS 0143	convention for a kitchen sink.									9. In the space provided below, draw,	the north point according to SABS							
								T			0 		<u>A</u> K	F				E			B			DETAILED DRAWING OF A SECTION	THEOREM AND A WINDOW LOAD-BEARING WALL AND A WINDOW			











SOLID GEOMETRY Given: The front and top view of a right regular square prism with blind square hole and a section line.	Instruction: Draw according to scale 1 : 1 and in first angle orthographic projection the following: - The given front and top view - The sectioned left view - The true shape of the section.	VASTE LIGGAME Gegee: Die voor- en bo-aansig van 'n regte reëlmatige vierkantige prisma met 'n blinde vierkantige gat asook 'n snyvlak.	Instruksie Teken volgens skaal 1 : 1 en in eerstehoekse ortografiese projeksie die volgende: - Die gegewe bo- en vooraansig - Die gesnyde bo-aansig - Die gesnyde linkeraansig - Die ware vorm van die gesnyde vlak.	N,		-

3EOMETRY tt view as well as the auxilitary view of a WEIGHT with a cutting plane.	on: cording to scale 1 : 1 and in first thographic projection the following: given front view and auxilliary view op view stioned left view <i>i</i> all constructions.	LIGGAME raansig en hulpaansig van 'n PAPIERGEWIG nylyn.	ie: olgens skaal 1 : 1 en in eerstehoekse iese projeksie die volgende: gewe vooraansig en hulpaansig oaansig eursnee linkeraansig alle konstruksies.	
SOLID GEOME Given: The front view (PAPERWEIGH	Instruction: Draw according angle orthogran - The given fro - The top view - Show all con	VASTE LIGGAI Gegee: Die vooraansig met 'n snylyn.	Instruksie: Teken volgens ortografiese pro - Die gegewe - - Die boaansig - Die deursnee - Toon alle koi	

 SOLID GEOMETRY Given: The front view and the auxiliary view of a paper weight Cutting plane A-A 	Instructions: Draw, to scale 1 : 1 and in first angle orthographic projection, the given front view and the auxiliary view. The top view. The sectional left view. 	 NOTE: Show ALL necessary construction. NO hidden detail is required. 	SOLIEDE GEOMETRIE Gegee: Die vooraansig en hulpaansig van die papiergewig. Snyvlak A-A	Instruksies: Teken, volgens skaal 1:1 en in eerstehoekse Teken, volgens skaal 1:1 en in eerstehoekse ortografiese projeksie die gegewe vooraansig en hulpaansig. Die boaansig. Die gesnyde linkeraansig. 	LET WEL: Toon ALLE nodige konstruksies. GEEN verborge besonderhede word verlang nie. 			

INTERPENETRATION AND DEVELOPMENT	 Given: The front view, top view and Isometric drawing of a connecting pipe for the ventilation system consisting of hexagonal main pipe (A) and a hexagonal branch pipe (B). The axis of both pipes lie in a common vertical plane. 	Instruction: Draw in first-angle orthographic projection the following views of the connecting piece dearly showing the curve of interpenetration: - The front view - The top view - The left view - Develop the surface of the branch pipe (B). NB: Show all necessary constructions and calculations.	 DEURDRINGING EN ONTWIKKELING Gegee: Die vooraansig, bo-aansig en Isometriese tekening van die hegstuk vir die ventitaiseiselsel bestaande uit 'n seshoekige pyp (A) en 'n seshoekige takpyp (B). Die aass van albei pyp el je in 'n gemeenskaplike vertiktale vlak. 	Instruksies: Teken in eerstehoekse ortografiese projeksie, die volgende aansigte van die hegstuk met die deurdringingskurwe duidelik getoon: - Die vooraansig - Die bo-aansig - Die linkeraansig - Ontwikkel die oppervlak van takpyp (B). NS- Toon ALLE nodige konstruksies en berekeninge.	

TRANSITION PIECES Given: The figure shows the front view and top view of a square to square transition piece. Instruction: Copy both views according to scale 1 : 1 and determine the following: * The surface developement of the transition piece. * Show ALL construction and the "FOLD LINES"	on the development. OORGANGSTUKKE Gegee: Die figuur toon die vooraansig en bo-aansig van 'n vierkant tot vierkant oorgangstuk.	Instruksie: Teken beide aansigte volgens skaal 1 : 1 en bepaal die volgende: * Die oppervlakontwikkeling van die oorgangstuk. * Toon ALLE konstruksies.asook die "VOULYNE" op die ontwikkeling.		

TRANSITION PIECES Given: The figure shows the front view and top view of a square to round transition piece. Instruction: Copy both views according to scale 1 : 1 and determine the following: * The surface developement of the transition piece. * Show ALL construction and the "FOLD LINES" on the development.	OORGANGSTUKKE Gegee: Gegee: Die figuur toon die vooraansig en bo-aansig van 'n vierkant na ronde oorgangstuk. Instruksie: Teken beide aansigte volgens skaal 1 : 1 en bepaal die volgende: * Die oppervlakontwikkeling van die oorgangstuk. * Toon ALLE konstruksies asook die "VOULYNE" op die ontwikkeling.		

LOCI:HELIX Given: Fig 1 - the top view of an AUGER as well as an illustration.	Specifications: - One and a half revolutions, starting at point A - The pitch is 60 mm	Instructions: Use the given information, draw a left handed AUGER by applying the given spesifications NOTE: - ALL construction must be shown - NO hidden detail required	LOKUSSE :HELIKS Gegee: Fig 1 - die bo-aansig van 'n AWEGAAR asook 'n illustraste.	Spesifikasies: - Een en 'n halwe omwenteling wat by punt A begin - Die steek is 60 mm	Instruksies: Gebruik die gegewe inligting en teken 'n linkerhandse AWEGAAR deur die gegewe inligting toe te pas: NOTA: - ALLE konstruksies moet getoon word - GEEN verborge detail m oet getoon word nie.	Fig 1	

 ONE: Acamshaff and a wedge-ended follower that reprocestes on a vertical contribution to the sease provided data a displacement passes through the centre of the carm shaft. INE TOURDES: The space provided data a displacement fease with uniform motion to a place in the sease a displacement fease with uniform motion to a place in the sease a displacement. Cover the next 45° the follower fease with uniform motion a placement fease with uniform motion a placement graph in sa interval and a wedge-ended data a vertical sease of the carm of the car	ADVERSE ADVECTORSE. ADVECTORSE ADVECTORSE A	QUESTION 1
 NETEUCTIONS: In the space provided draw a displacement graph that will impart the follower: e-form of " to 150" a follower siss with uniform motion to a height of 75 mm uniform motion to a height of 75 mm uniform motion to a sheight of 75 mm of the displacement graph has a holicoment factor a structure? To make the follower factor a structure? To make the displacement graph has a holicoment graph has a hol	NETRUCTIONS: The graph that will impart the following motion to apply that will impart the following motion to the graph that will impart the following motion to the graph that will impart the following motion to the graph that are needed. The second and a vertical control motion to an experiment of the motion motion and an excitant the displacement graph has a horizontal scale of 1:1. From the glowen information draw: the motion and a motion and a vertical scale of 1:1. From the glowen information draw: the motion and a motion and a vertical scale of 1:1. COURSE DRAWINGS LOCI: CAM	
The displacement graph has a horizontal scale of 6 mm equals 30° and a vertical scale of 1:1. From the given information draw: The cam profile if the cam rotates in a polynomial to the drawing: Can the following to the drawing: All the case and the following to the drawing to the d	The displacement graph has a horizontal scale of 6 mm equals 30° and a vertical scale of 1.1 From the given information draw: The cam podile if the cam rotates in a polycie if the cam rotates in the cam rotates in a polycie if the cam rotates in a poly	
From the given information draw: The cam profile if the cam rotates in a doctwise direction. Add the following to the drawing: . Entrelines. . ALL necessary construction.	From the given information draw: The cam profile if the cam rotates in a cockwise direction. Add the following to the drawing: • Centrelines. • ALL necessary construction. • ALL necessary construction. • ALL necessary construction.	
Add the following to the drawing: entrelines. Entrelines. The constant of notation. Construction.	Add the following to the drawing: Centretines: Direction of rotation. T. ALL mercessary construction. Add the following to the drawing: I. COURSE DRAWINGS LOCI: CAM	
	GRADE 11 COURSE DRAWINGS LOCI: CAM	
LOCI: CAM		







GRADE 11 COURSE DRAWINGS MECHANICAL ANALYTICAL

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OLIECTIONIC	ANCMEDS	
QUESIIQUS	ANOWERO	
On what date was the drawing approved?	09-06-2015	-
What material is used to manufacture the vertical guide?	CAST IRON	-
How many revisions have been made to the drawing?	2	-
What was the reason for the last revision?	Material changed	-
What was Peter responsible for?	Approve Drawing	-
What scale was used for the drawing?	SC4LE 1:1	-
What is the title of the drawing?	VERTICAL GUIDE	-
What is the drawing number?	1569-GC-J	-
Which Company was responsible for the design?	JANCOR DESIGNS	-
What drawing program was used?	AUTOCAD 2009	-
What is view 1 called?	TOP VIEW	-
What is view 2 called? SECTIONAL FRONT VI	W or SECTION A-A	~
What is view 3 called?	RIGHT VIEW	2
What is the dimension of hole A?	9	١
What is feature B called?	RIB/WEB	-
What is feature C called?	FILLET	-
What is the thickness of rib D?	OI	2
Determine the dimension at E?	04	2
Determine the dimension at F?	OI	2
In the space provided at the bottom of the page draw, in neat freehand the symbol for the convention of a bearing.		2
In the space provided at the bottom of the page draw, in neat freehand the symbol for the orthographic system used.		4
	TOTAL	30

VRAE	ANTWOORDE	
Wanneer is die tekening goedgekeur ?	09-06-2015	-
Watter materiaal word gebruik vir die vervaardiging ?	Gegote Yster	-
Hoeveel hersienings is daar van die tekening gemaak ?	Ś	-
Wat was die rede vir die laaste hersiening ?	Materiaal verander	-
Waarvoor was Peter verantwoordelik ?	Tekening Goedkeur	-
Watter skaal is gebruik vir die tekening ?	SKAAL 1:1	-
Wat is die titel van die tekenining ?	VERTIKALE GIDS	-
Wat is die nommer van die tekening ?	1569-GC-J	1
Watter maayskappy was verantwoordelik vir die ontwerp?	JANCOR DESIGNS	-
Watter tekenprogram is gebruik ?	AUTOCAD 2009	-
Wat word aansig 1 genoem ?	BO-AANSIG	1
Wat word aansig 2 genoem ? DEURSNEE VOORAAMSIG	of DEURSNEE A-A	2
Wat word aansig 3 genoem ?	REGTER AANSIG	2
Wat is die afmeting van gat A ?	6	1
Wat word kenmerk B genoem ?	RIB/WEB	+
Wat word kenmerk C genoem ?	FILLET	1
Wat is die dikte van plaat D ?	10	2
Wat is die breedte van plaat E ?	40	2
Wat is die afmeting van F ?	DI	2
Teken, in netjiese vryhand, in die voorsiende spasie, die konfensie simbool wat gebruik word om 'n laer voor te stel.		2
Teken die orthografiese simbool in die oop spasie aan die linker onderste hoek van die tekening.		4
	TOTAAL	30





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S	M	-	-	-	-	-	-	-	-	-	-	~	-	-	-	-	-	-	с	m	e	26		
ENGINEERING GRAPHIC AND DESIGN	sed new dwelling are shown. Complete the table belo	15-SSD-2012	32 HIGH STREET INANDA	CHANGE AND MOVE WINDOWS	a	m	e	WINDOW OPENING	FFL	NGL	STEP	BC	ROOM DESIGNATION	NORTH POINT	PLAN / FLOORPLAN	SOUTH WEST ELEVATION	RIGHT HAND SIDE	MILLIMETRES		6.8 + 6.8 + 9.8 + 3.9 + 3.9 + 1.65 + 1.65 + 4 = 3.6.5m	(5.15 * 9.8) + (4 * 1.65) + (3.9 * 1.65) = 63.505m ²		GRADE 11 COURSE DRAWINGS CIVIL ANALYTICAL	
	ANALYTICAL Two views and a title panel of a propos	1 What is the reference number of the drawing?	2 What is the address of the proposed new dwelling?	What is the reason for the revision of the proposed new dwelling?	4 How many doors are shown on the plan?	5 How many different sized windows are shown on the plan?	6 How many different floor finishes are there?	7 What does the line numbered 1 indicate?	8 What does the line numbered 2 indicate?	9 What does the line numbered 3 indicate?	10 What is the feature numbered 4?	11 What is the abbreviation for the fixture numbered 52	12 What does the label numbered 6 show?	13 What does the symbol numbered 7 indicate?	14 What would VIEW 1 be called?	15 What would VIEW 2 be called?	16 With reference to view 2, on which side of the view would you place the south east elevation?	17 What SI unit are the dimensions given in?	In the space provided on the title panel, draw, in neat freehand, the front view and top view of the SANS <i>10143</i> symbol for a bath.	19 Determine the perimeter of the dwelling in metres.	20 Determine the total area of the dwelling in m^2 .	TOTAL		
MOTES.						18. In the space provided,	draw, in neat freehand, the front view and top view of	the SANS 10143 symbol for a bath.					0						REVISION DATE OF REVISION B 01-04-2012	INTIALS DATE OF ATTRANTISSUE REVISION OF ATTACK REVISION DATE OF A AND AND FILE ATTACK PROJECT TITLE		DURBAN 4074 DURBAN 4074 TBL:031 3322793	PROMOGITIE PROMOSED NEW DWELLING FOR MR SS DLAMINI OF 32 HIGH STREET INANDA 00 STAND 32 PROMOGIMA	15 10.6 cose ref 15.5Sb-2012 15.SSb-2012 pawway scale part 11100 29-03-2012
																	13970 LIOUNGE			$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	VIEW 1			

























	ENGINEERING GRAPHICS AND DESIGN	 CIVIL and ELECTRICAL DRAWING GIVEN: A table of electrical symbols A table of fixtures A table of fixtures The incomplete floor plan showing the walls, windows, doors and position of the fixtures and the electrical fixtures A diagram showing the room designations and floor finishes 	 The incomplete floor plan. INSTRUCTIONS: Complete the given floor plan by adding the following: ALL fixtures as indicated by the abbreviations ALL the electrical fixtures as indicated by the numbers ALL hatching detail 	Label the following: The room designations with floor finishes NOTE: ALL drawings must comply with the guidelines and conventions contained in the SANBS 10143.	If used as an assessment task it would be marked out of out of 40. LOWER ORDER 10 MIDDLE ORDER 16 HIGHER ORDER 14	GRADE 11 COURSE DRAWINGS ELECTRICAL	
	FIXTURES B BATH S SINK WB WASHBASIN B HWB 5 5 5	BIC BULT-IN CUPBOARD ELECTRICAL FIXTURES 1. LIGHT SWITCH-TWO POLE 2. LIGHT SWITCH-TWO POLE 3. CELLING LIGHT 3. CELLING LIGHT 4. 2 × 40 W FLUORESCENT TUBES 5. SAITCH SOCRET ONTED LIGHT WC 3. 2 - 4 2. CELLING LIGHT WC 3. 2 - 4 5. 3 - 2 - 4 BIC 1. 2 - 4 5. 3 - 2 - 4 BIC 1. 2 - 4 5. 3 - 2 - 4 BIC 1. 2 - 4 5. 3 - 2 - 4 BIC 1. 2 - 4 BIC	BATHROOM KITCHEN FLOOR FINISH KITCHEN TILES LOUNGE: TILES BEDROOM: CARPET BATHROOM: TILES	ROOM LOUNGE ROOM DESIGNATIONS AND FLOOR FINISH	BEDROOM BEDROOM BEDROOM BEDROOM BEDROOM		PLAN SCALE 1 : 50
1:				Sink (5)	HATCHING		

ENGINEERING GRAPHICS & DESIGN



SCHOOL-BASED ASSESSMENT

GRADE 12 EXAMPLES

h isometric drawing of a bracket with a been prepared to the indicated scale.	ANSWERS							s of the bolt head.	well as the rest of the threaded hole.							SYMBOL A - QUESTION 3		
MECHANICAL Given: A drawing showing the incomplete front view, left view and an ititle block and a table of questions. Not all the drawings have l instructions: Complete the table below by neatly answering the question drawings and the title block.	QUESTIONS	1 On what date was the drawing first completed?	2 What scale is indicated for the drawing?	3 Name the feature marked symbol A?	4 Name the symbol, marked C, indicated on the welding symbol.	5 Determine the complete dimension at D.	6 Add the All-round-weld-symbol to the welding symbol.	7 Complete the front view by completing the M28 full threaded bolt, showing three faces	8 Complete the front view by completing the 35 mm long threaded shaft of M28 Bolt as	9 Complete the front view by adding the needed hatching.	10 Complete the left view to show the tapped hole only.	11 Add the cutting plane and label it S-S.						WELDING SYMBOL - ANSWER 6
											INCOMPLETE LEFT VIEW				574-PV2 FILE NAME: STP2.dwg	ABESTER DATE: 2014-03-14 REYTEN DATE: 2014-03-28	FEVILVE DATE: 2014-02-14	AMME: AUTOCAD SCALE: 1: 1
]			INCOMPLETE FRONT VIEW			ETRIC VIEW	8 SAMUEL STR DRAWING No. SE-5		DRAWN BY. W GRE	

	stions.	gs and [30]		-																								I			11		
	e of que	drawing	G	-	-	-	-	~	~	-	1	~	e	-	-	-	~	7	-	Я	7	e	4	- 30									
	assembly, a title block and a table	hich all refer to the accompanying	ANSWERS										5: C:	ILLET	PARTIAL SECTION	SPECIFIC PART HATCHING e.g. SUBBER or THIN PART	50	TO SHOW DETAIL	NTERRUPTED /IEW/CONTINUES	Ø6.35	35.47		/mbol for the projection system	TOTAL	ANSWER 20								
	rgements of a tapping valve red to the indicated scale.	y answering the questions, w	ONS	bly?	ig drawn?		e drawing?	used?		nufacture the main base?	d?	are there in the assembly?	is at: A: E			lled in solid?	assembly?	o enlarged detailed views?	/ention at G?	ce, determine the maximum	ce, determine the minimum	EW 3 and label it A-A.	draw, in neat freehand, the s			VALVE	2015/01/23	2015/01/16	2015/01/05	TAP VALVE TO BE USED FOR	TAPPING OF 134a, R11, R22 AND 501 REFRIGERANTS IN COPPER		CALE 2 : 1
ICAL (MECHANICAL)	ws and two detailed enla ings have not been prepa	ons: : the table below by neatl lock.	QUESTI	lat is the title of the assem	what date was the drawin	at is the drawing number?	lat scale is indicated for th	ich drawing program was	io approved the drawing?	at materlal is used to mar	at would VIEW 2 be called	w many socket head bolts	e the complete dimension	me the feature at F.	ne the type of section at □	y is the component at E fi	at is the total height of the	at is the purpose of the tw	at is indicated by the conv	h reference to the tolerand iension at H?	h reference to the tolerand iension at H?	ert the cutting plane on VII	he space provided below, ed.			DNILLAL	'ED: ANDREW BRAND	D: SOON DENTON	CHRISTI GREEF		1911		S S
ANALYT	Given: Three vie The draw	Instructi Complete the title b		1 WF	2 On	3 WF	4 WF	5 Wh	6 WF	7 WF	8 WF	9 Ho	10 Giv	11 Nai	12 Nai	13 WF	14 WF	15 Wh	16 Wh	17 Wit dim	18 Wit dim	19 Ins	20 In t use		TITLE		APPROV	CHECKE	DRAWN:			MECH	
													_			M4 SOCKET HEAD BOLT	-	3					_	3	FILE NAME: RCO/VK 0002.dwg	DRAWING No. 2015 - A - 005	ALL DIMENSIONS ARE IN MILLIMETRES.	DRAWING PROGRAM: AUTOCAD 2015	MATERIALS: STEEL, PEWTER AND RUBBER	BOOD BEFRICER		GRADE 12 ANALYTICAL	
			 				DELAILS						- M5									2	- 26	VIEW		MATERIAL	REF: DETAILED DRAWING	TOOL STEEL	TOOL STEEL	PEWTER	PEWTER	RUBBER	RUBBER
14				Ø	BE ALL DE	7 _ 04	l			_0			•		F							- - 02	ے س -	IEW 2	PARTS LIST	QUANTITY	1	3	-	~	-	-	-
	<u></u>		2.01 		د پل							<u>`</u>	- -			S S		777					Ø6 -0.35 RT	IN H		PART	VALVE ASSEMBLY	SOCKET HEAD BOLT	SQUARE BOLT WITH PUNCH	MAIN BASE	CAP	0-RING	O-SEAL

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	ions. The	igs and the [30]																						٦٢										
	and a table of quest	companying drawir	ISWERS	-	7	-	7	-	-	1	1	4	7	-		7	F	7	5	5	N		TOTAL 30	OJECTION SYMBC										
	oarts list, a title block	ch all refer to the ac	AN									ö										orojection system use		ANSWER 19: PR										
QUESTION 1: ANALYTICAL (MECHANICAL)	Given: The front view and right view of a copper pipe cutter assembly, a p drawings has not been prepared to the given scale.	Instructions: Complete the table below by neatly answering the questions, whi title block.	QUESTIONS	1 What is the title of the drawing?	2 What scale is indicated for the drawing?	3 Which drawing program was used?	4 Who approved the drawing?	5 In which unit are the dimensions presented?	6 What material is used to manufacture the cutter?	7 How many components make up the pipe cutter assembly?	8 What would VIEW 2 be called?	9 Determine the complete dimensions at A: B:	10 Measure the angle at E?	11 What is the thickness of the feature at F?	12 Name the type of finish at G.	13 What is the purpose for the feature at G?	14 How many surfaces of the pipe cutter assembly must be machined?	15 Referring to the parts list, name the part at H.	16 Referring to the parts list, name the part at J.	17 With reference to the tolerance, determine the minimum dimension at K?	18 With reference to the tolerance, determine the maximum dimension at K?	19 In the space below, draw, in neat freehand, the symbol for the p												
-	ļ .				L =			1-1	- 1	-		10 26			·	50				84°		•			DATE: 05-05-2016	DATE: 06-03-2016	DATE: 10-02-2016	AUTOCAD 2016	SCALE 1:1	1 BROAD STREET Prime Rusiness Park	www.gspprojects.co.za) } }]	TFR	-
-					R5				(H) 24		(B)						Ø20			0		024	VIEW 2		APPROVED BY: M MULLER	CHECKED BY: S DU BOIS	DRAWN BY: W GROENEWALT	DRAWING PROGRAM:	ALL UNSPECIFIED RADII ARE R2.			TTTLE	PIPF CUT	-)] -
-		R14			R5			- - - 9			- 24 - R2	13	~~~									ø 20	VIEW 1			MATERIAL	CAST IRON	CAST IRON	TOOL STEEL	TOOL STEEL	TOOL STEEL	TOOL STEEL	TOOL STEEL	ALU CASTING
(1)	46			14				18				4	35	•		Æ		ן ה	-	61	-				ARTS LIST	QUANTITY	-	-	2	-	-	-	-	-
_	<u>+</u>			-				99			0			0	3	-)	_								đ.	PART	G-FRAME	SLIDE	ROLLER	CUTTER	M4 LOCKING SCREW	M6 LOCKING SCREW	WORM SCREW	HANDLE
1																											-	N	0	4	5	0	N	00

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ENGINEERING GRAPHICS AND DESIGN

CRITERIA	ONT VIEW	POSSIBLE OBTAINED	14	2	4 1/2	8	2	6 2	$9\frac{1}{2}$	$7\frac{1}{2}$	8	62	EW	ω	ł	5	14	AL	9	6	15	91		ID TOTAL	E 12 AWINGS ASSEMBLY	
ASSESSMENT	SECTIONAL FR		1 M8 BOLT	2 SMALL WASHER	3 CAP	4 BASE + SPHERE	5 'O'- RING	e TOGGLE	7 BLOCK ATTACHMENT	8 LARGE WASHER + M16 NUT	9 HATCHING	SUBTOTAL	TOP VI	1 M8 BOLT	2 CAP	3 BASE	SUBTOTAL	GENER	1 CENTRE LINES	2 ASSEMBLY	SUBTOTAL	TOTAL	TOTAL PENALTIES(-)	GRAN	GRADE COURSE DR MECHANICAL /	

ERING GRAPHICS ND DESIGN	ASSEMBLY d isometric drawing of the parts joint assembly, showing the each part relative to all the	views of each of the parts of int assembly. Juestion on page 6. Draw, to nd in third-angle orthographic	e hollowing views of the ctor joint. tfront view on cutting plane from the direction of the arrow e exploded isometric drawing.	plane, which passes vertically centre of the assembly, is a top view of the base (part 4). NO hidden detail is required.	gs must comply with the contained in the SANS 10111. aces of the M8 bolts. [91]		PARTS LIST	QUANTITY MATERIAL	4 CAST IRON	CASTIRON 1 CASTIRON	1 CAST IRON	1 STAINLESS STEEL	1 RUBBER	1 STEEL	SHER 1 CAST IRON	1 CAST IRON	GRADE 12 JRSE DRAWINGS ANICAL ASSEMBLY		
ENGINEI A	MECHANICAL Given: • The exploded of a tractor position of e	 Orthographic the tractor join Instructions: Answer this quest scale 1 : 1 and 	projection the assembled trac • A sectional A-A, as seen shown on the	The cutting p through the shown on the The top view.	NOTE: • ALL drawing guidelines as • Show TWO fa • Show THREE			PARTS .	1 M8 BOLT	Z SMALL WA	4 BASE	5 SPHERE	6 O-RING	8 BLOCK	9 LARGE WA	10 M16 NUT	COL	11	
		SPHERE [5]	EE MIE							A CR		EXPLODED ISOMETRIC							
		SMALL WASHER [2]				CAP [3]		R37	FLO	4 HOLES MB				- <u>9</u> -					[4] DAOE [4]

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MECHANICAL ASSEMBLY	 Given: The exploded isometric drawing of the parts of a distribution The exploded isometric drawing the position of each part relative to all the others Orthographic views of each of the parts of the distribution box lock assembly 	 Instructions: Answer this question on page 6. Draw, to scale 2 : 1 and in third-angle orthographic projection, the following views of the assembled parts of the distribution box lock assembly: 	 4.1 A sectionant from view on cuting plane A-A, as seen from the direction of the arrow shown on the exploded isometric drawing. The cuting plane, which passes vertically through the centre of the assembly, is shown on the right view of the base (part 3). 4.2 The right view ALL drawing must comply with the guidelines contained in the SANS 10114 	 NOTE: Show THREE faces and ALL necessary construction of the M12 nut. Show ALL necessary construction of the ellipse. Show ALL necessary construction of the triangle. Add cutting plane A-A to the drawing. NO hidden detail is required. 	PARTS LIST DDE 12.1 - 7	PART QUANTITY MATERIAL	1 SHAFT 1 STAINLESS STEEL	2 SEAL 1 RUBBER 3 BASE 1 CAST IRON	4 GUIDE PIN 1 MILD STEEL	5 LOCKING LEVER 1 MILD STEEL R WASHED 1 MILD STEEL	7 M12 NUT 1 MILD STEEL	JPV 123 STRUBEN STREET	ENGINEERING CC www.jpwengineering.co.zz	DISTRIBUTION BOX LOCK	ALL DIMENSIONS ARE ALL UNSPECIFIED	
ç		-12- -12- -15- -15- -12- -12- -20- 						LOCKING LEVER [5]								
		seal [2]			3 BASE [3]									Whit View	EXPLODED ISOMETRIC DRAWING	



		lestions.	and tit l e [30]		1	1	1	1	1	7	7	-	1	7	7	-	-	-	5	2	2	3	<i>е</i>	4	30						
		mber deck, a title panel and a table of q	ch refer to the accompanying drawing	ANSWERS																		e in metres.	sting house and the new garage in	e front view and top view of the SANS	TOTAL	ANSWER 19 Show ALL calculations.		GRADE 12 COURSE DRAWINGS			
	QUESTION 1: ANALYTICAL (CIVIL)	Given: The site plan of a existing house with a proposed new garage and ti The drawing has not been prepared to the indicated scale.	Instructions: Complete the table below by neatly answering the questions, whi panel.	QUESTIONS	1 What is the project number?	2 How many signatures are required?	3 How many revisions have been made to the drawing?	4 Who is the client?	5 On what date was the site plan printed?	6 How many new additions are indicated on the site plan?	7 What does the abbreviation <i>IC</i> stand for?	8 What is indicated by the arrows on the line at 1?	9 Name the feature at 2.	10 In what colour should the feature at 3 be shown?	11 What does the line at 4 indicate?	12 What does the broken line at 5 indicate?	13 What is the length of the boundary line at 6 in metres?	14 What is the width of Freedom Street in millimetres?	¹⁵ What is the difference in ground level height between corner A and corner B of the buildings in metres?	16 On which side of the existing house is the new timber deck?	17 $$ Which municipal service is found on the land adjacent to stand $$ 212	18 In the space below, determine the perimeter of the existing house	19 In the space below, determine the combined total area of the exit square metres.	20 In the space provided in the title panel, draw, in neat freehand, th 10143 graphical symbol for a BATH.		ANSWER 18 Show ALL calculations.		500	08	X 00001 X	
	NOTE: Contractors must verify all dimensions and levels on site before commencing work	evers on the bound community work Architects must be notified immediately of any discrepancies.	CLIENT'S SIGNATURE	ANSWER 20	In the space below, draw, in neat	of the SANS 10143 graphical symbol	for a BATH.														1 2015-01-27 Add timber deck		KEY ARCHITECTS 96 Protea Street	POTCHEFSTROOM 083 130 2201	key@webmail.co.za	PRIVITED BY DATE OF PRIVI LLM PRINTERS 2015-02-13 DRAWING TITLE SITE PLAN	PROJECT PROPOSED NEW GARAGE AND TIMBER DECK FOR MRS SCHUTTE	ON STAND 21, FREEDOM STREET.	AFSP-2015 URAWING NUMBER AFSP-2015 VG 002 DATE DRAWN CHECKED SCALE	2015-01-10 AD BC 1:250	REFERENCE COUE Q1P1N2015
2	6		STAND	148.5, 149 300 150 151 151 151			STAND 21		CTAND 5525 CTAND	20 20 20 20	9						HOUSE					El ECTRICA			143 24000	1 MH FREEDOM STREET 4,7 m	SITE PLAN SCALE 1 : 250)			

able of questions. The drawing has not been	ANSWERS	-	-		-			-	-	F	1	1	1	1	-	2	0	4	4	m	TOTAL 30	ANSWER 19 how ALL calculations.			
ANALYTICAL (CIVIL) Given: A site plan for proposed new consulting rooms, a title panel and a ta prepared to the indicated scale. Instructions: Complete the table below by neatty answering the questions, which al panel.	QUESTIONS	1 On what date was the stand surveyed?	2 What was Vishnu responsible for?	3 How wide is the pavement on Duiker Avenue in metres?	4 What is the client's name?	 5 How many new parking bays are indicated? 6 How many new inspection eyes are required? 	7 On which property is the municipal sewer connection located?	8 In what colour is a new building presented on a site plan?	9 In what colour is a new sewer line presented on a site plan?	10 What does the arrow at 1 indicate?	11 What does the line at 2 indicate?	12 What does the line at 3 indicate?	13 Name the feature at 4.	14 What must be done to the existing building on the stand?	¹⁵ What is the difference in height between the highest and the lowest corner of the stand in metres?	16 What is the distance from wall X to Duiker Avenue in metres?	17 What would the elevation of the new consulting rooms facing stand 78 be called?	In the space below, determine the perimeter of the new consulting rooms in metres. Show ALL calculations.	In the space below, determine, in square metres, the total floor area that needs to be tiled if the outside walls are 200 mm thick. Show ALL calculations.	In the space provided in the title panel, draw, in neat freehand, the front view and top view of the SANS 10143 graphical symbol for a single kitchen sink.		ANSWER 18 Show ALL calculations.	<u>}</u>	24700	
NOTE: Contractors must verify all dimensions and levels on site before commencing work. Architects to be notified immediately of any discrepancies. ARCHITECTS SIGNATURE	20. In the space provided below, draw,	in neat freehand, the front view and top view of the SANS 10143	graphical symbol for a single kitchen sink.											3 2013-09-11 Remove ex driveway	2 2013-09-08 Add new driveway	1 2013-08-28 Move new RE	REVISION DATE DESCRIPTION	MINKI'S DREAM HOMES	PRINTED BY DATE OF PRINT		PROJECT	PROPOSED NEW CONSULTING ROOMS FOR DR. AL SATION ON STAND 77 AT 5 DUIKER AVENUE PRETORIA.	PROJECT NUMBER 001 1 0f 4	REFERENCE CODE DRAWN BY CHECKED BY Q1P1-EXEMP-2014 BEYERS VISHNU	DATE SCALE 2013-09-12 1:250
LAND SURVEYOR'S CERTIFICATE OF THE BOUNDARY LENGTHS AND CORNER HEIGHTS OF STAND 77 AT 5 DUIKER AVENUE PRETORIA. SURVEYED ON 01-10-2011 BOUNDARY CORNER HEIGHTS MILLIMETRES AB 42688 A 1022 AB 42688 A 1022	BC = 31684 B = 1024 CD = 42688 C = 1025 2	DA = 31684 D = 1021			NEW SEWED	MUNICIPAL CONNECTION MEW SEWER STAND 34			STAND 76		NEW PERF	CONSULTING CONSULTING		 	Nuc 55				MUNICIPAL		NEW 3,3 m EXISTING 3,3 m NOTOR MOTOR MOTOR MOTOR MOTOR	SITE PLAN		38	20

FREEHAND Given: FLOOR PLAN Instruction: Use the space provided and redraw the floor plan in freehand according to the given size.	VRYHAND Gegee: VLOERPLAN Instruksie: Gebruik die spasies voorsien en teken die vloerplan vryhand volgens die gegewe grootte oor.





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SSMENT CRIT	FLOOR PLAN	12	8 <u>1</u>	8	4	4	36 <u>‡</u>		7	4	51	2	18 <u>†</u>	ETAILED SECTIO	15	6	ъ	5	-	35	90	(.)			
ASSE		DOORS + WINDOWS	ELECTRICAL	FIXTURES	HATCHING	LABELS	SUBTOTAL	SC	ROOF	WALLS + RWDP + FFL + GULLEY	DOOR + WINDOW	LABELS	SUBTOTAL	DE	ROOF DETAIL	FOUNDATIONS + WALLS + SLAB	DOORS + GULLEY	HATCHING	LABELS	SUBTOTAL	TOTAL	PENALTIES (FINAL TOTA		
		7	2	e	4	5			-	5	e	4			1	7	e	4	2						

SECTION A-A SCALE 1 : 20






CIVIL DRAWING	 Given: The incomplete south elevation of a new cottage, showing the walls, the window, the door opening, the roof and notes the incomplete floor plan showing the walls, position of the doors, windows, fixtures and electrical layout Roof notes with a schematic diagram of a roof truss The incomplete foundation and external wall detail The incomplete foundation and internal wall detail A table of roof components Room designations and floor finish A table of electrical symbols Room designations and floor finish A table of fixtures 	 wall foundation, drawn to scale 1: 20, on page 6 Instructions: Answer this question on page 6. 4.1 Using the given incomplete floor plan, draw, in first-angle orthographic projection and to scale 1: 50, the following views of the new cottage: 4.1.1 THE COMPLETE FLOOR PLAN 4.1.1 THE COMPLETE FLOOR PLAN Add the following features to the drawing: ALL dors and windows ALL fixtures as indicated by abbreviations 	 ALL electrical fittings as indicated by numbers ALL hatching detail 4.1.2 THE SOUTH ELEVATION 4.1.2 THE SOUTH ELEVATION Fine outside walls, window and door detail The roof detail, including the fascia board and barge board The finished floor level 	 4.2 Using the given break line and incomplete internal wall foundation, draw, to scale 1: 20, a DETAILED SECTION according to cutting plane A-A of the area in the ellipse shown on the incomplete floor plan Show the following features on the drawing: The complete internal and external foundation, wall and with a stream of the stream of stream of the st	window detail The roof detail, including the fascia board • ALL hatching detail. ONLY the substructure hatching may be drawn in neat freehand. NOTE: None of the features or fixtures above the ellipse needs to shown on the detailed section.	 Label the following: The south elevation including the scale The detailed section including the scale The room designations and floor finishes Using the correct abbreviation, the following features in the correct view: ground level. finished floor level and dampproof course NOTE: ALL drawings must comply with the guidelines and graphical symbols contained in the SANS <i>10143</i>.
	I BECROOM ESIGNATIONS FLOOR FINISHES 1 BECROOM: THE 3 KITCHEN: THE 4 LOUNGE: THE	DOOR AND WINDOW SCHEDULE	WINDOW (NZ)	WINDOW (W3)	FIXTURES	ASIN TOLLET SHOWER 200 1200 1200 1200 1200 1200 1200 1200
220 X X	NDOW OPENING OR OPENING OR OPENING 250 250 250 250 250 250 250 250 250 250	DOCR DOCR MINDOW WINDOW WINDOW WINDOW WINDOW WINDOW MI	DREASENT LIGHT 2 × 40 W LING LIGHT LING LIGHT TICHED SOCKET OUTLET TICHED SOCKET OUTLET TICHED SOCKET OUTLET MALL FOUNDATION DETAIL WALL FOUNDATION DETAIL WALL FOUNDATION DETAIL WALL FOUNDATION DETAIL RECTION TO THE SWITCH.	J300/ ROOF CAP I15 x 38 mm WALL PLATE I15 x 50 mm PURLIN	300 x 10 mm FIBRE CEMENT BARGE BOARD 200 x 20 mm FASCIA BOARD	ELECTRICAL SYMBOLS
	INCOMPLETE SOUTH ELEVATION			ROOF NOTES: ROOF PITCH 20° 115 x 38 mm ROOF TRUSS ON 115 x 38 mm WALL PLATES ROOF OVERHANG = 300 mm	ROOF COVER 15 mm FIBRE CEMENT SHEET ON 73 × 50 mm PURLINS @ 1000 mm c/c 200 × 20 mm FASCIA BOARD ON ALL SIDES AND 300 × 10 mm BARGE BOARDS ON GABLED ENDS 9 mm CELLING BOARD ON 38 × 38 mm	BRANDERING STRIPS @ 315 mm cc





PERSPEKTIEF Gegee : Degee : Degee : Deanosigte van 'n PATIO en BRAAI en die inligting benodig om 'n 2 Punt Perspektief te teken PV - Prentvlak HL - Horisonlyn CL - Grondlyn SP - Staanpunt Instruksie : Voltooi die perspektief tekening - Rig die tekenvel volgens die horisonlyn (HL) - Toon ALLE nodige konstruksies PERSPECTIVE GEEN verborge besonderhede word verlang nie - Toon ALLE nodige konstruksies - Toon ALLE nodige konstruksies - Ricute plane - Locate and label the vanishing points - No hidden detail is required - Show all necessary constructions - Show all necessary constructions	



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 ISOMETRIES Gegee: Die vooraansig en boaansig van 'n basis vir 'n pilaar in derdehoekse ortografie, bie vooraansig en boaansig van 'n basis vir 'n pilaar in derdehoekse ortografie, asook die posisie van punt A op die tekenvel. Instruksies: Omskep die ortografiese aansigte van die pilaarbasis na 'n isometriese tekening. Maak hoek A die laagste punt van die tekening. Maak hoek A die laagste punt van die tekening. Toon ALLE nodige konstruksies. Geen verborge detail word verlang nie. 	 ISOMETRIC Given: The front view and top view of a base for a pillar in third orthographic, as well as the position of point A on the drawing sheet. Instructions: Convert the orthographic views of the pillar base into a isometric drawing. Make corner A the lowest point of the drawing. Show ALL necessary constructions. No hidden detail is required. 		
		→ ◄	

ENGINEERING GRAPHICS AND DESIGN	Given: The front view and incomplete top view of a right regular pentagonal prism and a right regular hexagonal pyramid of equal base edge length. Both solids have been cut by a plane VT Instructions:	ortnographic projection the following views of both solids: The sectional top view The sectional right view The true shape of the cut surfaces Show ALL necessary construction. • Sow ALL hidden detail.		GRADE 12 COURSE DRAWINGS SOLID GEOMETRY	-	
ш					<u> </u>	

SOLID GEOMETRY Given: The front view and an auxiliary view of a truncated right regular square pyramid with a centrally placed right regular hexagonal pyramidal hole.	Instructions: Draw, to scale 1 : 1, the following views of the solid: 2.1 The given front view 2.2 The top view and left view • Planning is essential. • Show ALL hidden detail. • Show ALL necessary construction.	VASTE LIGGAME Gegee: Die vooraansig en 'n hulpaansig van 'n afgeknotte regte vierkantige piramide met 'n sentraalgeplaaste regte reëlmatige seskantige piramiedvormige gat.	Instruksies: Teken, volgens skaal 1 : 1 die volgende aansigte van die vaste liggaam: 2.1 Die gegewe vooraansig 2.2 Die boaansig EN linkeraansig 8 Beplanning is noodsaklik. • Toon ALLE verborge besonderhede. Toon ALLE nodige konstuksies.	88	X de As		

SOLID GEOMETRY Given: • The front view and auxiliary view of a socket spanner • Cutting plane A-A
Instructions: Draw, to scale 1:1, the following views: 2.1 The given front view and auxiliary view 2.2 The right view of the model 2.3 A sectioned top-view according to cutting plane A-A.
VASTE LIGGAME Gegee: • Die vooraansig en hulpaansig van 'n soksteutel • Snyvlak A-A
Instruksies: Teken, volgens skaal 1 : 1, die volgende aansigte: 2.1 Die gegewe vooraansig en hulpaansig 2.2 'n Regteraansig von die model 2.3 'n Snit bo-aansig volgens snyvlak A-A. • Geen verborge besonderhede word verlang nie.
BL B
-

ENGINEERING GRAPHICS AND DESIGN	Given: The top view and incomplete front view of a right square branch piece (A), that has been shaped to fit around a right regular hexagonal prism (B). The axes of both pieces lie in a common vertical plane. Instructions: Instructions: Instructions: Instructions: Instructions: Instructions: Instructions: Instructions: Internetical and will be formed between	 minetration that will be formed between them: The top view The complete front view Develop the surface of the branch piece Label the development. Show ALL necessary construction. Show ALL hidden detail. 	GRADE 12 COURSE DRAWINGS INTERPENETRATION	

PHICS	view and pentagonal s shaped to in the same prism.	sms: g the curve anch piece	and hidden	s z	
NG GRA DESIGN	nt view, top right regular square prisms ch prisms lie he pentagona	ews of the pris t view showin ces of the br	construction	ADE 12 DRAWING NETRATIO	
INEERIN AND I	omplete froi view of a tith two right 4 d it. s of the bran	cTIONS: a following via ven top view amplete front ft view d'A' d'A'		GR/ COURSE INTERPE	
ENGI	GIVEN: The inc auxiliary prism wi fit aroun- the axe: plane as	INSTRU Draw the gi • The gi • The co of intel • The le • Develo markee	Show al detail.		



ENGINEERING GRAPHICS AND DESIGN	Given: The front view and top view of a rectangle to a square transition piece Instructions: Draw, to scale 1 : 1, the following views of the transition piece: • The given top view • The development	NOTE: • Make AB the seam. • Show ALL construction.	VB-SEAM	GRADE 12 COURSE DRAWINGS TRANSITION PIECE

ONTWIKKELING Gegee: Die vooraansig en bo-aansig van 'n oordragstuk in eerstehoekse ortografiese projeksie. Instruksie: Gebruik die gegewe inligting en voltooi die ONTWIKKELING.	DEVELOPMENT Given: The front view and the top view of a tranfer piece in first angle orthographic projection. Instruction: Using the given information, draw the DEVELOPMENT.	

LOKUS - HELIKS Gegee: Gegee: Die bo-aansig van 'n gedeelte van 'n ronde veer van 'n motor se onderstel. Instruksie: Noltooi, volgens skaal 1 : 1, die volgende: - Die vooraansig van die ronde veer met 'n 60mm steek, wat kloksgewys een en 'n halwe omwenteling voltooi halwe omwenteling voltooi - Toon ALLE nodige konstruksies - Geen verborge besonderhede word verlang nie.	LOCI - HELIX Given: The top view of a section of a round spring of a motorcar. Instruction: Complete, to scale 1 : 1, the following: - The front view of a round spring with a 60mm pitch, completing one and a half turn in a dockwise direction - Start at the top left with the spring - Start at the top left with the spring - Start at the top left with the spring - No hidden etail is required.	

 LOCI - HELIX Given: Given: The top view and the incomplete front view with the starting point and shape of a packaging shoot. Instruction: Use the given information and complete the shoot over one and a half turn in an anti-clockwise direction. Pltch = 60 mm Show all constructions No hidden detail is needed. 	LOKUS - HELIKS Gegee: Die bo-aansig en onvolledige vooraansig wat die beginpunt en vorm van 'n verpakkingsglybaan aandui.	Instruksie: Gebruik die gegewe inligting en voltooi die glybaan wat een en 'n half draaie maak in 'n anti-kloksge- wyse rigting. - Steek = 60 mm - Toon alle konstruksies - Geen verborge besonderhede hoef getoon te word nie.	

LOCI (CAM) Given: • The detail of a roll) I of a roller-ended follower and the cam shaft for a disc cam
 Specifications: The minimum dist 10 mm and Rot 10 mm and Rot 10 mm and Rot 0 ver the first 90° 0 ver the next 90° motion. 0 ver the remainin 	bins: num distance from the cam profile to the centre of the cam shaft and Rotation = dockwise parts the following motions to the follower: first 90° the follower rises 20 mm with constant velocity. next 90° the follower rises another 40 mm with simple harmonic remaining 180° the follower returns to its starting position with cceleration and retardation.
Instructions: • Draw, to scale 1 : • Draw, in the corre- and a displacemen- given motions. • Label the displace • Project and draw 1 • Show ALL necess	s: scale 1 : 1, the given view of the follower and the camshaft. scale 1 : 1, the given view of the follower and the camshaft. the correct position and to a horizontal scale of 7mm equal to 30° blacement scale of 1 : 1, the complete displacement graph for the displacement graph and include the scale. direction of rotation on the cam profile. L necessary construction.
LOKUS (NOK) Gegee: Die besonderhede)K) nderhede van 'n rollervormige volger en nokas vir 'n skyfnok
 Spesifikasies: Die minimum afstemme die rotasie Beweging: De nok dra die volg: Oor die eerste 90' Harmoniese beweinen Oor die oorbitwene eenvormige versin 	es: tum afstand vanaf die nokprofiel na die senter van die nokas = 10 e rotasie = kloksgewys die volgende bewegings aan die volger oor: erste 90° styg die volger 20 mm met konstante snelheid. Jagende 90° styg die volger nog 40 mm met eenvoudige se beweging. orbywende 190° keer die volger terug na die beginposisie met ge versnelling en vertraging.
Instruksies: • Teken, volgens sk • Teken, volgens sk • Teken, volgens sk • Teken, volgens sk • Benoem die vorpl • Projekteer en teke • Toon ALLE nodi	Jgens skaal 1:1, die gegewe aansig van die volger en die nokas. Joe korrekte posisie en volgens 'n norisontale skaal van 7mm 30° en 'n verplasingskaal van 1 : 1, die volledige segrafiek vir die gegewe bewegings. Fie verplasingsgrafiek en stuit die skaal in. Fie verplasingsgrafiek en stuit die skaal in. Fie vordsnie op die nokprofiel. En ordige konstruksies.
	- 014

LOCI-MECHANISM COCI-MECHANISM Given: A = 32 mm $CD = 100 mmD = 32 mm$ $CD = 100 mmD = 30 mm$ $D = 30 mmD = 30 out d is presenting a side on CD$; as well as point C with a pixot at D as well as point of the connected rod DE moves left and right a horizontal plane as the crank AB rotates. Instruction: Taw the lows of point P for one full revolution of the crank AB. D = 30 mm D = 100 mm D = 100 mm D = 30 mm D = 100 mm D = 30 mm		
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LUCI - MECHANISM A mechanism to open a mechanical gate on an assembly line. Crank OA is attached to a shaft which rotates clock-wise around point O. Rod AB, attached to the crank at A slides freely through a fixed point at C. AB rotates freely about point A.	Given: A Schematic presentation as well as a drawing showing the assembly and the movement of the parts of the meganism.	Instruction: Use point O as reference to redraw the schematic drawing according to scale 1 : 1 and: - trace the loci generated by point B locate on rod AB, - trace the loci generated by point E locate on rod AB. NB. Show the necessary constructions.	LOKUSSE - MEGANISMES 'n Meganisme om 'n meganiese hek op 'n monteerlyn oop te maak. Krukas OA is gekoppel aan 'n as wat kloksgewys roteer rondom punt O. Stang AB, verbind aan die kruk by A, gly vryelik deur 'n vaste punt by C. AB roteer vryelik om punt A.	Gegee: 'n Skematiese voorstelling sowel as 'n tekening wat die samestelling asook die bewegende dele van die meganisme toon.	Instruksie: Gebruik punt O as verwysing om die skematiese tekening volgens skaal 1 : 1 oor te teken en: - bepaal die lokus van punt E op stang AB, - bepaal die lokus van punt E op stang AB. NB: Toon die nodige konstruksies.	
		ο				

	QUESTIONS	ANSWERS		VRAE	ANTWOORDE
-	On what date was the drawing first completed?	2014-02-14		0 p watter datum was die tekening die eerste keer geteken?	2014-02-14
2	What scale is indicated for the drawing?	SCALE 1 : 1		2 Wat is die skaal wat aangedui word vir die tekening	SKAAL1:1
ς	Name the feature marked symbol A?	MACHINE SYMBOL		Benoem die kenmerk was as simbool A gemerk is.	MASJINERINGSIMBOOL
4	Name the symbol, marked C, indicated on the welding symbol.	V-TYPE BUTT WELD		Benoem die simbool, gemerk C, wat op die sweissimbool aangedui is.	V-TIPE SWEISLAS
5	Determine the complete dimension at D.	Ø 56		5 Bepaal die volledige afmeting by D.	Ø 56
9	Add the All-round-weld-symbol to the welding symbol.			Voeg die rondom-sweis-simbool by sweissimbool.	
7	Complete the front view by completing the M28 full threaded bolt, show	ing three faces of the bolt head.		Voltooi die vooraansig deur die M28 voldraad bout te voltooi, deur drie	aansig van die boutkop te teken.
∞	Complete the front view by completing the 35 mm long threaded shaft	of M28 Bolt as well as the rest of the threaded hole.		3 Voltooi die vooraansig deur die 35 mm lang gegroefde M28 Bout sowel	as die res van die gegroefde gat te teken.
6	Complete the front view by adding the needed hatching.			Voltooi die vooraansig deur die nodige arsering by te voeg.	
10	Complete the left to show the tapped hole only.		-	0 Voltooi die linkeraansig deur slegs die getapte gat te toon.	
1	Add the cutting plane and label it S-S.		-	1 Voeg die snyvlak by en benoem dit S-S.	
	TOTAL			10	TAAL
	ERONT VIEW	TEFT VIEW			
16					

	- <u>14</u>			ANALYTICAL (MECHANICAL)					
				Given: Three views an The drawings h	d two detailed enk ave not been prepa	argements of a tapping valvented to the indicated scale.	e assembly, a title blo	ock and a table o	of questions	
				Instructions: Complete the ta the title block.	able below by neat	ly answering the questions, '	which all refer to the	accompanying d	rawings and [30]	-
	5.01				QUEST	ONS	AN	SWERS		
				1 What is th	ie title of the assem	hbly?	TAPPING VALVE		-	
	s	50		2 On what c	late was the drawi	1g drawn?	2015/01/05		-	
	.01	04		3 What is th	ie drawing number	~	2015 - A - 005		-	
				4 What sca	le is indicated for th	ne drawing?	SCALE 2:1		-	
				5 Which dra	awing program was	used?	AUTOCAD		1	
				6 Who appr	oved the drawing?		ANDREW BRAND		-	
				7 What mat	erlal is used to ma	nufacture the main base?	PEWTER		1	
				8 What wou	ld VIEW 2 be calle	d?	SECTIONAL FRONT	- VIEW	1	
				9 How many	y socket head bo l ts	s are there in the assembly?	3		1	
		- M5		10 Give the o	complete dimensio	nsat: A:Ø4 B:4	t C:26		3	
		×.		11 Name the	feature at F.		FILLET		1	
				12 Name the	type of section at I	· ·	PARTIAL SECTION		-	
			HEAD BOLT	13 Why is the	e component at E f	illed in solid?	SPECIFIC PART HA RUBBER or THIN PA	TCHING e.g. ART	-	
		u c		14 What is th	ie total height of th	e assembly?	29		1	
			3	15 What is th	ie purpose of the tv	vo enlarged detailed views?	TO SHOW DETAIL		2	
		033		16 What is in	idicated by the con	vention at G?	INTERRUPTED VIEW/CONTINUES		-	
				17 With refer	ence to the to l erar າ at H?	ice, determine the maximum	Ø6.35		7	
				18 With refer dimensior	ence to the tolerar า at H?	ice, determine the minimum	Ø5.47		N	
		02		19 Insert the	cutting plane on V	IEW 3 and label it A-A.			m	
	200 +0.35 RT -5	A 26	-	20 In the spa used.	ce provided be l ow	, draw, in neat freehand, the	symbol for the projecti	on system	4	
	Here and Alexa	VIEW	\ THICKENED 3 1½ x 2 = 3					TOTAL	30	
	PARTS LIST		FILE NAME: RCO/VK 0002.dwg					ANSWER 20		
	PART QUANTITY	MATERIAL	DRAWING No. 2015 - A - 005	_	DNILLAR	VALVE	•{	FREEHAND	,	
-	VALVE ASSEMBLY 1	REF: DETAILED DRAWING	ALL DIMENSIONS ARE IN MILLIMETRES.	APPROVED:	ANDREW BRAND	2015/01/23				
2	SOCKET HEAD BOLT 3	TOOL STEEL	DRAWING PROGRAM: AUTOCAD 2015	CHECKED:	SOON DENTON	2015/01/16	+-+++++++++++++++++++++++++++++++++++++	+ + (-		
e	SQUARE BOLT WITH PUNCH	TOOL STEEL	MATERIALS: STEEL, PEWTER AND RUBBER	DRAWN:	CHRISTI GREEF	2015/01/05]	7	
4	MAIN BASE	PEWTER	BACO REFRICERA		5 EDISON BLVD	TAP VALVE TO BE USED FOR	-			
2	CAP 1	PEWTER			1911	TAPPING OF 134a, R11, R22 AN 501 REFRIGERANTS IN COPPER				
9	0-RING	RUBBER	GRADE 12 ANALYTICAL ((MECHANIC/	→ ()					
7	0-SEAL 1	RUBBER				CALE 2 : 1				

4

ANALYTICAL (MECHANICAL)

ANTWOORDE	1 PYPSNYER	2 SKAAL 1:1 1	3 AUTOCAD 2016 1	4 M MULLER	5 MILLIMETER/mm 1	6 GEREEDSKAPSTAAL 1	7 NEGE/9	8 REGTERAANSIG 1	9 A: M8 B: R2 C: Ø10 D: 145 4	10 63° 64° 65° 2	11 3	12 KARTELING 1	15 BETER GREEP 2	14 5	15 ROLLER 1	16 WURMSKROEF 2	17 3.85 2	18 4.3 2	19 Sien hieronder 4	TOTAAL 30	ANTWOORD 19: PROJEKSIESIMBOOL • VRYHAND		•	BOAANSIG EN VOORAANSIG KORREK GEPLAAS VIR PUNTETOEKENNING ** GEEN PUNT VIR ENIGE DELE AS DIE POSISES OMGERUIL IS NIE § UIR VRYHAND SLEGS TOEGEKEN AS KENNIS VAN "DERDEHOEKS" GETOON WORD
	-	-	-	-	-	-	-	-	4	5	-	-	5	-	-	2	2	2	4	L 30				
ANSWERS	TTER	1:1	AD 2016	ER	ETER / mm	TEEL		VIEW	B: R2 C: Ø10 D: 145	65°		ING	R GRIP		R	1 SCREW			See below	TOTAL	ANSWER 19: PROJECTION SYMBOL	FREEHAND		TOP-AND RIGHT VIEW CORRECTLY PLACED FOR MARKS TO BE AWARDED •• NO PART MARKS TO BE AWARDED IF POSITIONS SWOPPED FOSITIONS SWOPPED FORTIONS SWO







Gemodereer																								
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								LAK						υ	В	A	ᆈᆂ	6						
GSKRITERIA	ŭ	0	KOMBUIS EILAND	2009 - 351	P MSOM	1:100	GEUT	AVV / AFGEWERKTE VLOERV	NGV / GV INGEBOUDE KAS	wc	NOORD AANWYSER	VLOERPLAN	SUID AANSIG	LASDRAENDE MUUR	VOGWEERLAAG	BREEKLYN	BOLAAG/VLOERAFWERKING KOMPAKTE HARDEPUIN	tijese vryhand, die vooraansig en b		18°	SWART	41.2 m	82.64 m²	
ASSESSERIN	Hoeveel vensters word on die	plan getoon?	Wat is die rede vir die hersiening op die tekening?	Wat is die projeknommer?	Wie is die eienaar van die voorgestelde nuwe woning?	Watter skaal is vir die tekening gebruik?	Benoem die kenmerk genommer 1.	Wat word deur die Iyn genommer 2 aangedui?	Wat word deur die Iyn genommer 3 aangedui / Benoem die kenmerk genommer 4.	Wat is die afkorting vir die vaste toebehore	Wat word deur die simbool genommer 6 aangedui?	Wat sal AANSIG 1 genoem word?	Wat sal AANSIG 2 genoem word?		Met verwysing na die gedetaillerde tekening	van die lasdraende muur en fondasie, pas die	letter op die tekening by elk van die gelyste kenmerke.	Teken in die spasie voorsien in die titelblok, in ne	aansig van die SABS-konvensie vir 'n bad.	Wat is die helling (hoek) van die dak?	Watter kleur moet alle nuwe vensterglas op 'n voorleggingstekening wees?	Bepaal die omtrek van die woning in m	Bepaal die totale area van die woning in m^2 .	
L	,	-	2	3	4	5	9	~	20 D	10	÷	12	13			4		15		16	17	18 E	19	

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	T CRITERIA	9	ISLAND IN KITCHEN	2009 - 351	P MSOMI	1:100	GUTTER	FFL / FINISHED FLOOR LEVE	BUILD-IN CUPBOARD	wc	NORTH POINT	FLOOR PLAN	SOUTH VIEW	LOAD-BEARING WALL	DAMP-PROOF COURSE	LINE BREAK	SCREED		at freehand, the front view and to	18°	BLACK	41.2 m	82.64 m²	
	ASSESSMEN	How many windows are shown on the plan?	What is the reason for the revision to the drawind?	What is the project number?	Who is the owner of the proposed new	What scale has been used for the drawing?	Name the feature numbered 1.	What does the line numbered 2 indicate?	What does the fine numbered 3 indicate? Name the feature numbered 4.	What is the abbreviation for the fixture	what does the symbol numbered 6 indicate?	What would VIEW 1 be called?	What would VIEW 2 be called?			With reference to the detailed drawing of	the load-bearing wall, match the letter on the drawing with each of the features listed.		In the space provided in the title block, draw, in ne of the SABS convention for a bath.	What is the pitch (angle) of the roof?	What colour must all new window glass be on a presentation drawing?	Determine the perimeter of the dwelling in m.	Determine the total area of the dwelling in m ² .	
		~	2	ო	4	5	9	~ 0	α σ	9	=	12	13			14			15	16	17	18	19	

	stions.	nd title [30]			-			_	1	_	1		-		-		_		01	01	~	~	+	0	_					T	
	e of que	awing ar	SS								•												NNS 2	OTAL 3	tions.	22					
	deck, a title panel and a table	fer to the accompanying dra	ANSWER	SP-2015			S SCHUTTE	15-02-13		SPECTION CHAMBER	RECTION OF FLOW	EE	q	INTOUR LINE	MOLISH/REMOVE	,25 m	00 mm	Ę	UTH-WEST	ECTRICAL SUBSTATION	etres.	nouse and the new garage in	it view and top view of the SA	F	ANSWER 19 Show ALL calculat 13 v 6 = 78	$6 \times 7 = 42$ $6 \times 7 = 42$ $10 \times 8 = 80$ $8 \times 6 = 48$ 248	GRADE 12	CIVIL ANALYTI			
QUESTION 1: ANALYTICAL (CIVIL)	Given: The site plan of a existing house with a proposed new garage and timber The drawing has not been prepared to the indicated scale.	Instructions: Complete the table below by neatly answering the questions, which ref panel.	QUESTIONS	1 What is the project number? AF	2 How many signatures are required? 2	3 How many revisions have been made to the drawing? 1	4 Who is the client? MF	5 On what date was the site plan printed? 20	6 How many new additions are indicated on the site plan? 2	7 What does the abbreviation <i>IC</i> stand for? INS	8 What is indicated by the arrows on the line at 1? DIF	9 Name the feature at 2.	10 In what colour should the feature at 3 be shown? RE	11 What does the line at 4 indicate?	12 What does the broken line at 5 indicate? DE	13 What is the length of the boundary line at 6 in metres? 30,	14 What is the width of Freedom Street in millimetres? 4 7	15 What is the difference in ground level height between corner A 3 n and corner B of the buildings in metres? 3 n 3 n	16 On which side of the existing house is the new timber deck? SC	17 Which municipal service is found on the land adjacent to stand ELI 21?	18 In the space below, determine the perimeter of the existing house in me	In the space below, determine the combined total area of the existing t square metres.	²⁰ In the space provided in the title panel, draw, in neat freehand, the fror <i>10143</i> graphical symbol for a BATH.		ANSWER 18 Show ALL calculations.		13+6+6+6+3+8+10+20=72 m 200				
NOTE: Controdom much write all dimensions and	contractors must very all optimicitions and levels on site before commencing work. Architects must be notified immediately of any discrepancies.	CLENTS SIGNATURE	ANSWFR 20	In the space below, draw, in neat	of the SANS 10143 graphical symbol	for a BATH.			6		•			•						1 2015-01-27 Add timber deck		KEY ARCHITECTS 96 Protea Street	POTCHEFSTROOM 083 130 2201	<u>key@webmail.co.za</u>	PRIVITED BY DATE OF PRIVITING TILLA PRINTERS 2015-02-13 DRAWING TITLE 2015-02-13 CATTE DI AN	PROJECT PROPOSED NEW GARAGE AND THINDED FOUND AND COUNTY	IIMBER DECK FOR MRS SCHUTTE ON STAND 21, FREEDOM STREET.	PROJECT NUMBER A ECE-2015 VG, 002	DATE DRAWN CHECKED SCALE		2015-01-10 AD BC 1:250
		STAND	35 149 30000 150 150 151			STAND			SIAND VIEW GARAGE 0 20							HOUSE			DECK			145 145 145 NUMBER 200194	144 PC 3mBL	143 24000 146	FREEDOM STREET 4,7 m	SITE PLAN SCALE 1:250					

	1	-	-	-	-	1	1	-	1	-	1	1	1	-	-	2	2	4	4	e	TAAL: 30						
ANTWOORDE	01-10-2005	NASIEN VAN DIE TEKENING	3 m	Dr AL SATION	Q	4	ERF 34	ROOI	BRUIN		I GRENSLYN	2 VERWYDER / BREEK AF / SLOOP	3 AANGRENSENDE GEBOU	t SLOOP	5 4 m	5 15,97 m	VOORDOOS AANSIG	3 102,8 m [berekening 1, antwoord 2, meter 1]	$\frac{1}{374.91}$ m ² [berekening 1, antwoord 2, meter ² 1]) (Sien hieronder.)	10	VRYHAND •		Ο			
	-	7	۳ ۳	4	5	9	7	80	6	10	11	12	13	14	15	16	17	15	15	20							
	-	-	~	~	-	1	1	-	-	-	1	7	-	-	~	2	2	4	4	m	TAL: 30					 	
ANSWERS	-	RAWING		~	-	-	-	1	1	OW 1	1	JSH 1	ING 1	-	~	2	EVATION	in 1, answer 2, metre 1] 4	tion 1, answer 2, metre ² 1] 4	m	TOTAL: 30						
























ENGINEERING GRAPHICS AND DESIGN	Given: The front view and top view of a rectangle to a square transition piece Instructions: Draw, to scale 1 : 1, the following views of the transition piece: The given top view. The development NOTE: • Mare Bithe seam. • Show ALL construction.	

























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