



THEME	ENGINEERING GRAPHICS AND DESIGN			
SCHOOL:	DATE	Day	Month	Year

CYCLE / WEEK	1	2	3	4	5	6	7	8	9	10	TERM	1	2	3	4
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THEME	MECHANICAL, INTERPENETRATION/DEVELOPMENT														
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INTEGRATION WITH OTHER SUBJECTS

Business Studies	Manufacturing	✓	Human Science	Mathematics
Commerce Studies	Engineering	✓	Social Science	Computers
Management Studies	Technology	✓	Arts and Culture	Physical Sciences
Service Studies	Languages		Agricultural Sciences	Life Sciences

CONTEXT	CRITICAL OUTCOMES (CO's)	DEVELOPMENTAL OUTCOMES (DO's)
Civil	✓ 1. Problem solving 2. Teamwork	1. Learn more effectively 2. Responsible citizens
Mechanical	✓ 3. Self-management 4. Research and critical analysis	3. Culturally & aesthetically sensitive 4. Explore education & career opportunities
Electrical	5. Effective communication 6. Science and technology 7. The world as a set of related systems	5. Entrepreneurship
	Skills	Knowledge
		Values including Attitudes

NCS PRINCIPLES	ASSESSMENT					
	LTSM (resources used in teaching & learning)	TEACHING & LEARNING STRATEGIES (Learning Activities)	ASSESSMENT ACTIVITIES (Assessment Activities / Tasks)			
			TOOLS	METHODS		
Social Transformation	Observation	✓	Show & Demonstrate	✓	Rating Scales	Self Assessment
Outcomes-based Education	Environment		Explain the Technology	✓	Observation Sheets	Peer Assessment
Higher knowledge & Skill	Models	✓	Explain the Terminology	✓	Checklists	Group Assessment
Integration & Applied competence	CAD – Software	✓	Producing free hand drawings		Task Lists	✓ Teacher Assessm.
Progression	Audio Visual	✓	Self made Models		Memo/Mask	✓ External Assessm.
Articulation & Portability	Worksheets	✓	Design	✓	Rubrics / Grids	✓
Human rights, Inclusivity, Environmental & Social justice	Drawing Instruments	✓	Class discussion		EVIDENCE COLLECTION	
Valuing Indigenous Knowledge Systems	Transparencies / OHP	✓	Group discussion		Observation	
	Chalkboard / Posters	✓	Group work		Test - based	✓
Credibility, Quality & Efficiency	Other (specify)		Individual work	✓	Task based	✓

CONTENT: LEARNING OUTCOMES(LO's) AND ASSESSMENT STANDARDS(AS's)

LO1	LO2	LO3	LO4
11.1.1 Relationship environment	11.2.1 Identify Problems	11.3.1 Code of Practice	11.4.1 Interpretation Drawing
11.1.2 Human Right Issues	11.2.1 Research	11.3.2 Projects multi/pict.	11.4.2 Drawing Principles
11.1.3 HIV/AIDS	11.2.3 Final Solution	11.3.3 CAD Drawings	11.4.3 Multi & single view
11.1.4 Communication	11.2.4 Present solution	11.3.4 Basic design	11.4.4 Pictorial Drawings
11.1.5 Entrepreneurship	11.2.5 Evaluation	11.3.5 Drawing Techniques	11.4.5 Sectioning multiview
11.1.6 Electronic impact on Comm.		11.3.6 Sectional Views	11.4.6 Design Process
		11.3.7 Graphic Comm.	11.4.7 CAD
		11.3.8 Loci	11.4.8 Loci

Lesson / Period Breakdown per Topic

Prior Knowledge: Grade 10 EGD

Teacher Activities	Learner Activities	Evidence	Time	Date Comp.
<p>Topic: REVISION: Single and multi-view drawing principles and sectioning using freehand and instruments</p>	<p>1st and 3rd angle orthographic projection techniques. Emphasis on 3rd angle.</p> <p>Apply to the following topics</p>			
<p>Topic: Mechanical drawing</p>	<p>Draw according to the SANS guidelines: Non-sectional, sectional, half sectional and part sectional views of simple assemblies from Industry.</p> <ul style="list-style-type: none"> • Include the following: Hexagonal bolts and nuts, keys and keyways, washers/spacers, dimensioning techniques, title, scale, cutting planes, hatching, notes and symbol of projection. 	<p>Presentation drawings</p>	<p align="center">18</p>	
<p>Topic: Interpenetrations Perpendicular / Inclined axes Teacher action: Revise geometrical solids of grade 10.</p> <p>Introduce learners to interpenetrations when two objects or solids penetrate or are joined at 30°, 45°, 60° or 90°.</p> <ul style="list-style-type: none"> • Determine curves of the following interpenetrations: • 2 right prisms • Two cylinders • Prism to cylinder • Prism to pyramid • Cylinder to pyramid • Prism to cone • Cylinder to cone • Transition pieces. 	<p>Determine the curve of interpenetration when two objects or solids penetrate or are joined at 30°, 45°, 60° or 90°.</p> <ul style="list-style-type: none"> • The focus should be on industrial examples, e.g. pipes, hoppers and transition pieces. 	<p>Presentation drawings</p>	<p align="center">14</p>	

<p>Topic: Developments (as applied to interpenetrations as above)</p>	<p>Determine the surface developments of the parts of an interpenetration, TRANSITION PIECES and containers. The focus should be on industrial examples, e.g. container covers/lids, pipes, hoppers and transition pieces. (seam allowances should be included where relevant)</p>	<p>Presentation drawings</p>	<p>10</p>	
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<p><u>Intervention Strategy</u></p> <p><u>Enrichment:</u></p> <p><u>Remedial:</u></p>	<p><u>DATE</u> <u>TOPIC /</u> <u>THEME</u> <u>COMPLETED</u></p>
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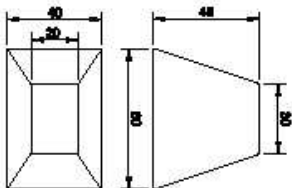
QUESTION 2: DEVELOPMENT

Given:
The front view and top view of a transition piece showing a rectangle to a hexagon.

Involve:

- Copy the given views of the transition piece.
- Develop the surface of the transition piece.
- Show ALL necessary construction.

[24]



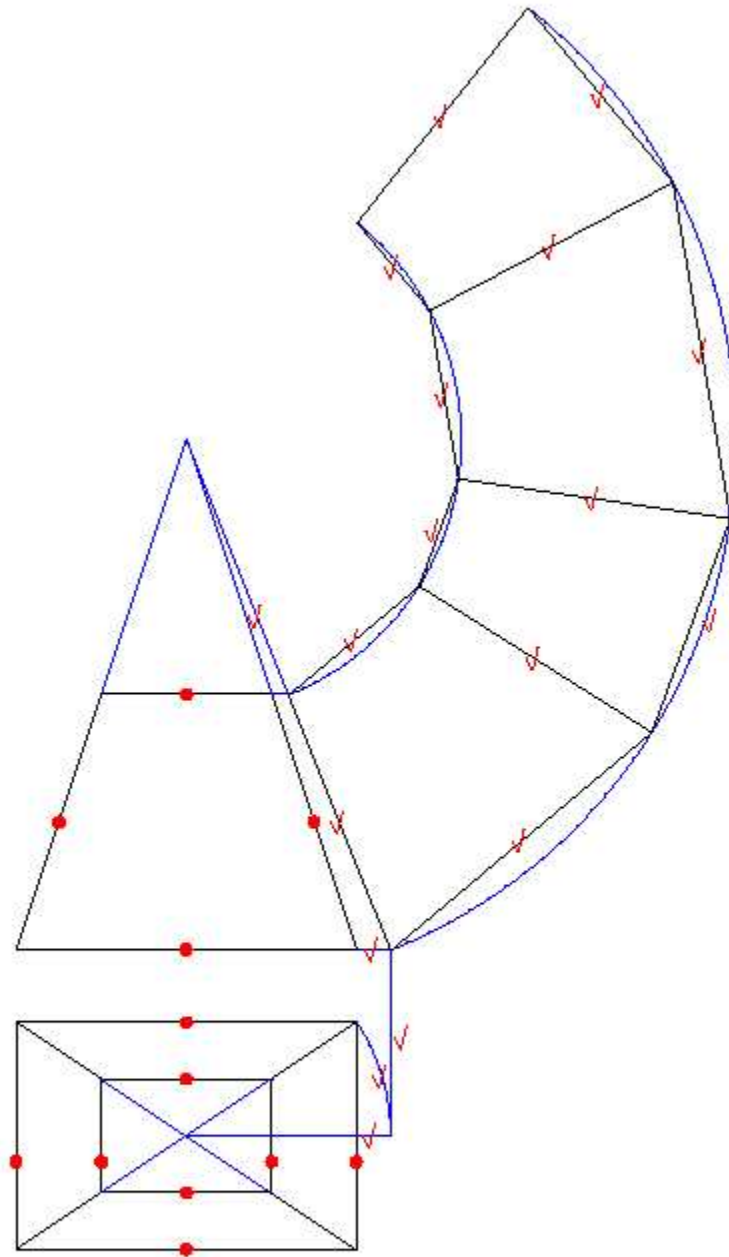
ASSESSMENT CRITERIA

GIVEN	=	6
TRUE LENGTH	=	5
DEVELOPMENT	=	13
TOTAL	=	24

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EXAMINATION NUMBER	
EXAMINATION NUMBER	3

Please turn over



ASSESSMENT CRITERIA	
GIVEN	= 8
TRUE LENGTH	= 5
DEVELOPMENT	= 13
TOTAL	= 24

QUESTION 2 PAPER 1
GRADE 11 EXEMPLAR 2007
MEMORANDUM

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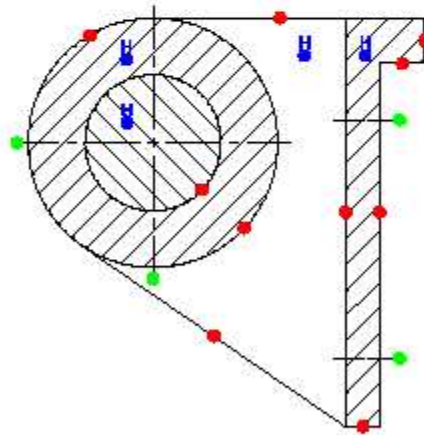


Complete the table below by filling in the number of the matching feature to the description in the column provided.

1. A cutting plane	C	11. A shoulder on a shaft	Q
2. A grub screw	Q	12. A full section	I
3. A square on a shaft	N	13. A bolt	H
4. Third-angle orthographic projection symbol	D	14. Internal screw threads	P
5. A keyway in a shaft	M	15. First-angle orthographic projection symbol	E
6. Hatching adjacent parts	G	16. A bearing	F
7. Diamond knurling	A	17. A bush	T
8. A taper on a shaft	J	18. A nut	B
9. An S-break	R	19. A part section	K
10. A spring washer	L	20. A shaft	S

MARKING CRITERIA

ANSWERS	= 10
TOTAL	= 10



ASSESSMENT CRITERIA	
SIZE AND PROPORTION	= 1
OUTLINE	= 5
CENTRE LINE	= 2
HATCHING	= 2
TOTAL	= 10

QUESTION 1 PAPER 2
GRADE 11 EXEMPLAR 2007
MEMORANDUM

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QUESTION 1A: MATCH THE TERMS

Given:
A table of descriptions and a table with the graphics of a number of common mechanical features.

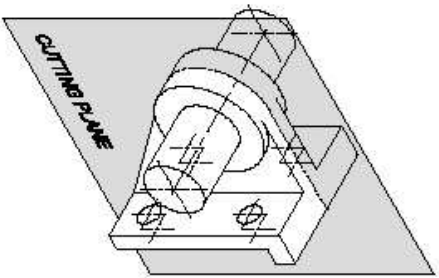
Instructions:

- Select the feature from the graphics below that best fits the description then place the number in the table.
- Only use each feature ONCE.

Complete the table below by filling in the number of the matching feature to the description in the column provided.

1. A cutting plane		11. A shoulder on a shaft	
2. A grub screw		12. A full section	
3. A square on a shaft		13. A bolt	
4. Third-angle orthographic projection symbol		14. Internal screw threads	
5. A keyway in a shaft		15. First-angle orthographic projection symbol	
6. Hatching adjacent parts		16. A bearing	
7. Diamond hatching		17. A bush	
8. A taper on a shaft		18. A nut	
9. An Spline		19. A part section	
10. A spring washer		20. A shaft	

A 	B 	C 	D
E 	F 	G 	H
I 	J 	K 	L
M 	N 	O 	P
Q 	R 	S 	T



QUESTION 1B: FREEHAND DRAWINGS

Given:
A pictorial view of a bracket and a sheet assembly, with a cutting plane passing through them.

Instructions:

- Convert the pictorial drawing into an orthographic drawing. Draw TWICE the size, and in neat free-hand, the sectional front view that will be created by the cutting plane passing through the assembly.

[10]

ASSESSMENT CRITERIA

SIZE AND PROPORTION	= 1
OUTLINE	= 8
CENTRE LINE	= 2
HATCHING	= 2
TOTAL	= 10

EXAMINATION NUMBER

EXAMINATION NUMBER

2