STAPEL

education

Department of Education
FREE STATE PROVINCE

ENGINEERING GRAPHICS AND DESIGN

GRADE 11

TEST

SEPTEMBER 2017

TIME: 1 $\frac{1}{2}$ HOUR

TOTAL: 75

This question paper consists of 6 pages

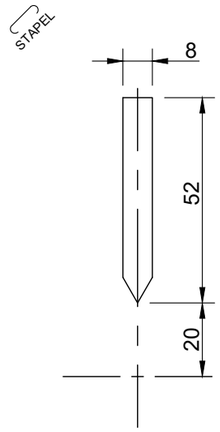
INSTRUCTIONS AND INFORMATION

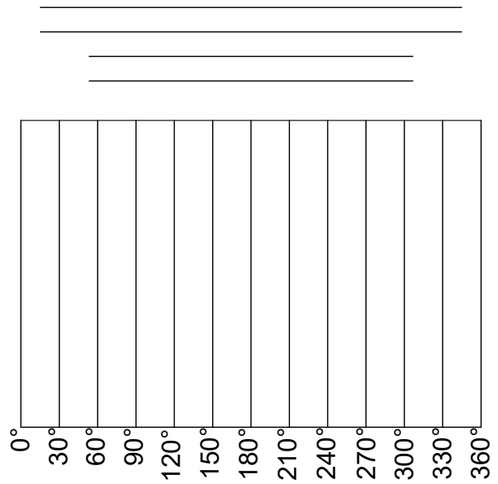
1. Answer all the questions.
2. ALL drawings are in first-angle orthographic projection, unless stated otherwise.
3. ALL drawings must be drawn to scale 1:1, unless stated otherwise.
4. ALL questions must be answered on the DIAGRAM SHEET as instructed.
5. ALL the pages must be stapled in numeric sequence,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

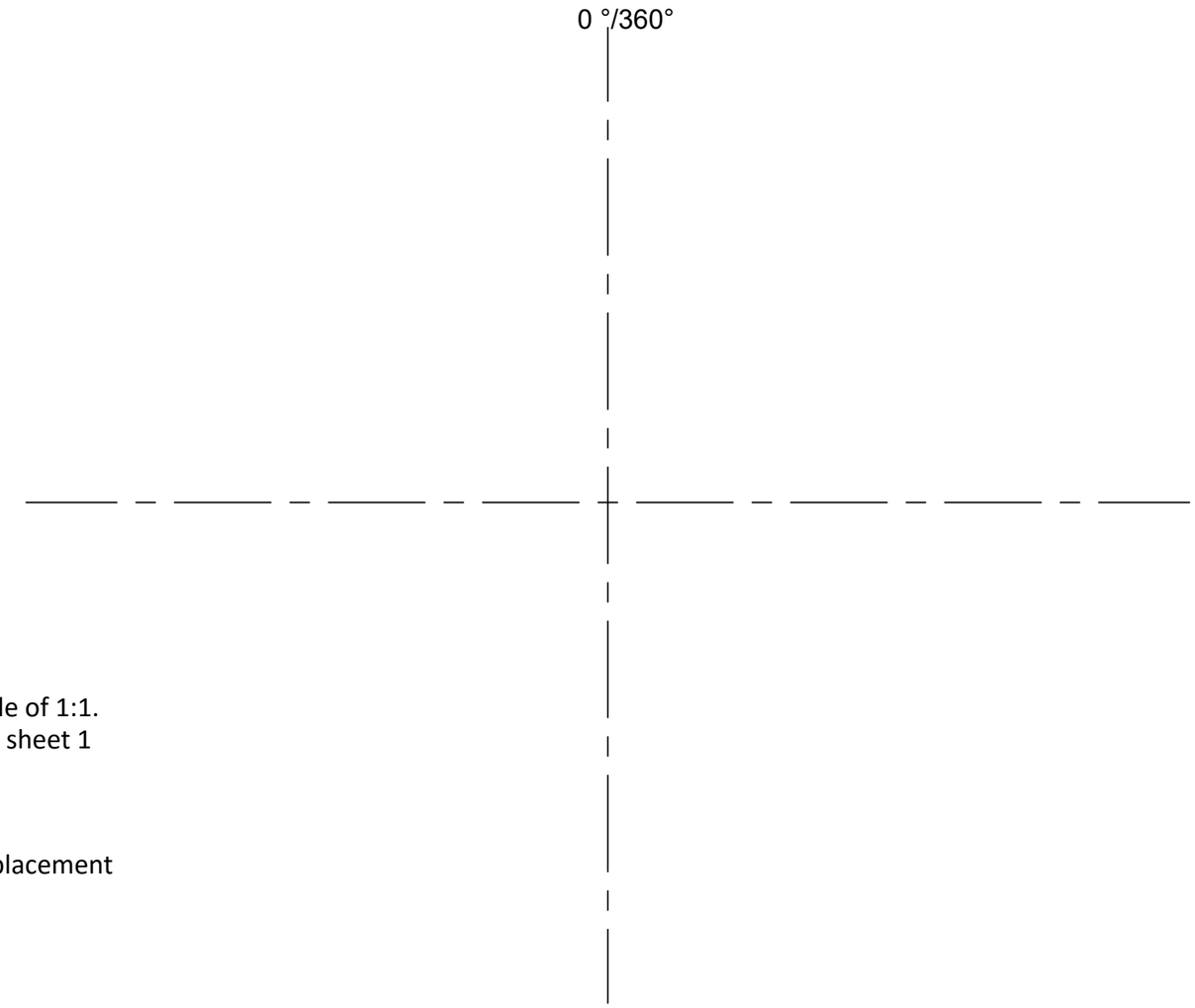
FOR OFFICIAL USE ONLY						
QUESTION	MARKS OBTAINED		½	MODERATED		½
1						
2						
3						
TOTAL						
	7	5		7	5	

FINAL CONVERTED MARK	CHECKED BY
50	

NAME & SURNAME		GRADE		1







QUESTION 1 (LOCI)

Given:

- The detail of a wedge-end follower drawn on a reduced scale.
- The displacement graph with a horizontal scale of 6mm = 30° and a displacement scale of 1:1.
- The center lines of the cam, drawn to a scale of 1:1 in the correct position on diagram sheet 1 (page 2).

Instructions:

Use the following information and construct according to scale 1:1 from the given displacement graph the cam profile to give a constant movement to the roller follower.

- The follower reciprocates along the 0°/360° centerline by means of uniform motion.
- The diameter of the cam shaft is 20 mm.
- The minimum radius of the cam is 20 mm.
- The stroke height is 50 mm.
- The cam rotates clockwise.
- 50 mm (100%) rise takes place during the first 120° of the cam rotation.
- The follower then rest for 60°.
- The follower descend 50% of the stroke height for 60°.
- The rest of the descend takes place for the last 120° to the height of origin.

Note:

- Show the direction of rotation on the cam profile.
- Show all constructions.
- Supply the displacement graph with a title and scale in the given guidelines. **[25]**

ASSESSMENT CRITERIA				
1	PLACING: FOLLOWER, MIN RADIUS & CAM SHAFT ($\frac{7}{2}$)	3.5		
2	DIVISION OF CIRCLE & DIRECTION ($\frac{4}{2}$)	2		
3	UNIFORM MOVEMENT (12)	12		
4	PLOTTING ($\frac{11}{2}$)	5.5		
5	PROFILE ($\frac{2}{2}$)	1		
6	LABELING ($\frac{2}{2}$)	1		
	TOTAL	25		

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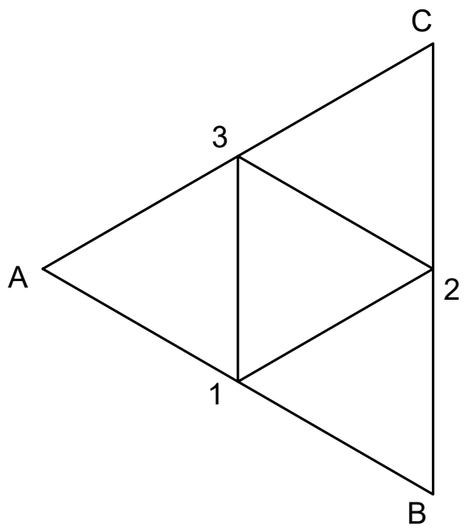
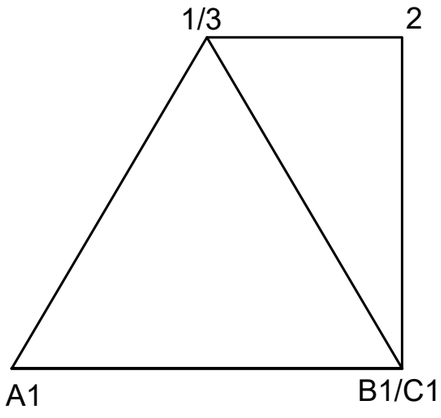
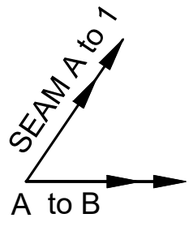






QUESTION 2 (TRANSITION PIECES)

Given: Diagram sheet 2 shows a front view and top view of a triangular - to - triangular transition piece.
Starting position A to B and A to 1 is also shown on diagram sheet 2.

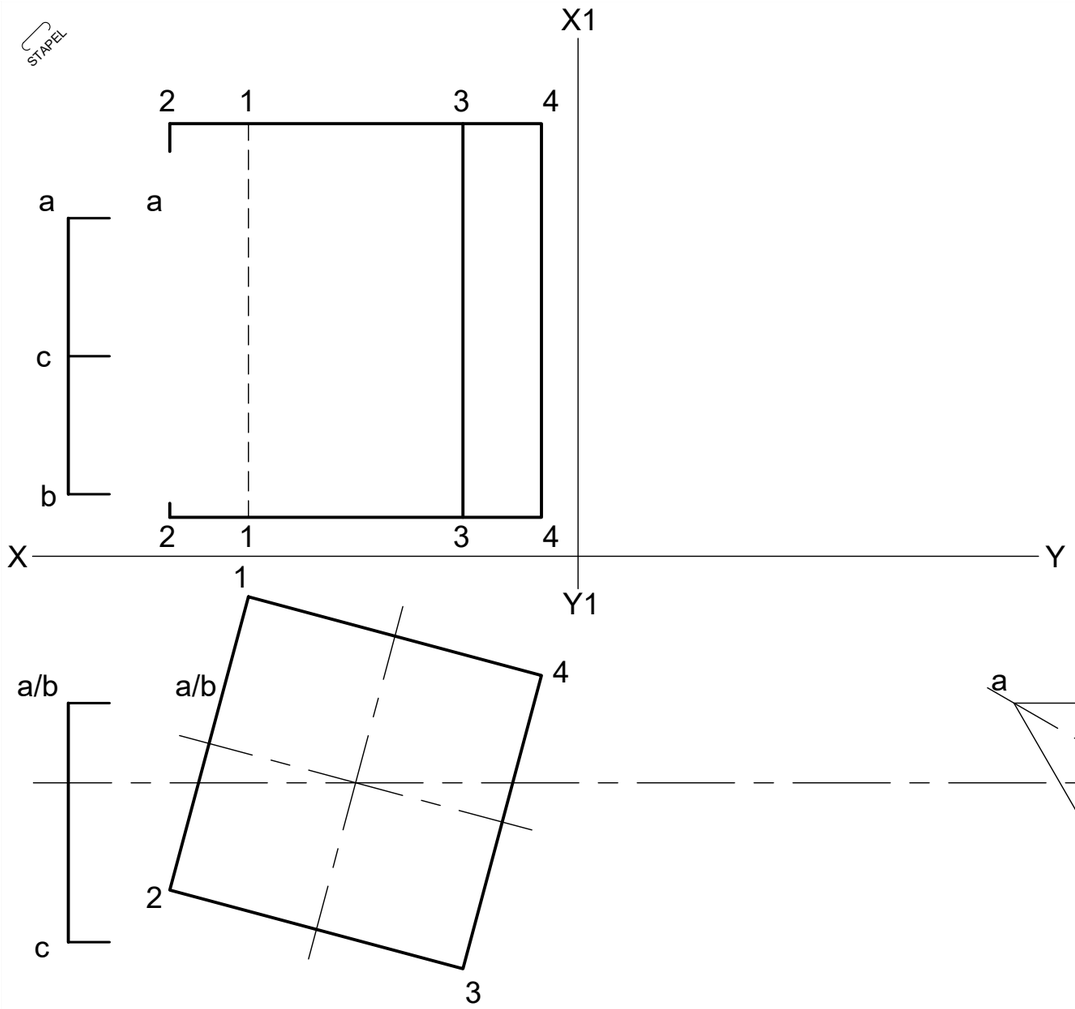
Question: Develop the surface of the transition piece.

Note:

- Both triangles are equilateral.
- Use A to 1 as the seam of the transition piece.
- Use the given shortened line A to B for the starting point of the development.
- Show all construction lines and fold lines. **[25]**

ASSESSMENT CRITERIA				
1	True length (5)	5		
2	Development 20	20		
	TOTAL	25		

DIAGRAM SHEET 2	ENGINEERING GRAPHICS AND DESIGN	SEPTEMBER 2017 TEST	NAME & SURNAME		GRADE		3



QUESTION 3: INTERPENETRATION AND DEVELOPMENT

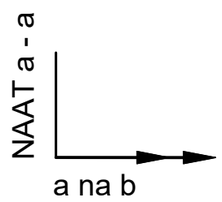
Given: The incomplete front view and top view of a right equilateral triangular prism that has been shaped to fit around a right square prism. The axes of both prisms lie in a common vertical plane. The auxiliary views of the triangular prism is also shown on diagram sheet 3.

Instructions: Draw, to scale 1:1, the following:

3.1 The complete top view.
3.2 The complete front view clearly showing the curve of interpenetration.
3.3 The left view.
3.4 The development of the surface of the triangular prism (make a - a the seam).

Note:

- Show all hidden detail.
- Show all necessary construction and fold lines. **[25]**



ASSESSMENT CRITERIA				
1	INTERPENETRATING - FRONT VIEW ($\frac{16}{2}$)	8		
2	TOP VIEW ($\frac{4}{2}$)	2		
3	LEFT VIEW ($\frac{10}{2}$)	5		
5	DEVELOPMENT - BRANCH PRISM ($\frac{20}{2}$)	10		
	TOTAL	25		

DIAGRAM SHEET 3	ENGINEERING GRAPHICS AND DESIGN	SEPTEMBER 2017 TEST	NAME & SURNAME		GRADE		4