



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Certificate 2016

Marking Scheme

Technical Graphics

Ordinary Level

Note to teachers and students on the use of published marking schemes

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

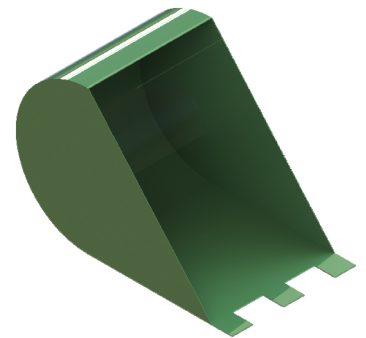
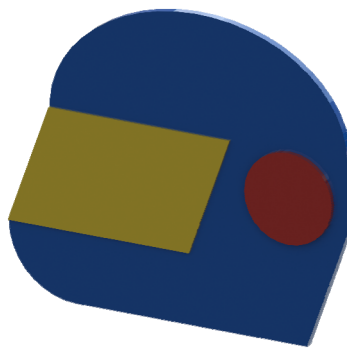
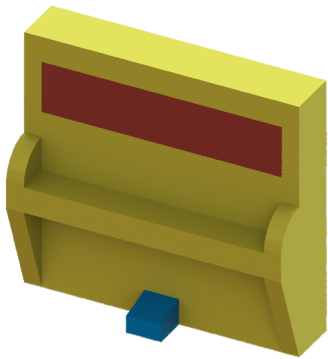
Future Marking Schemes

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.



Junior Certificate Examination, 2016

Technical Graphics
Ordinary Level



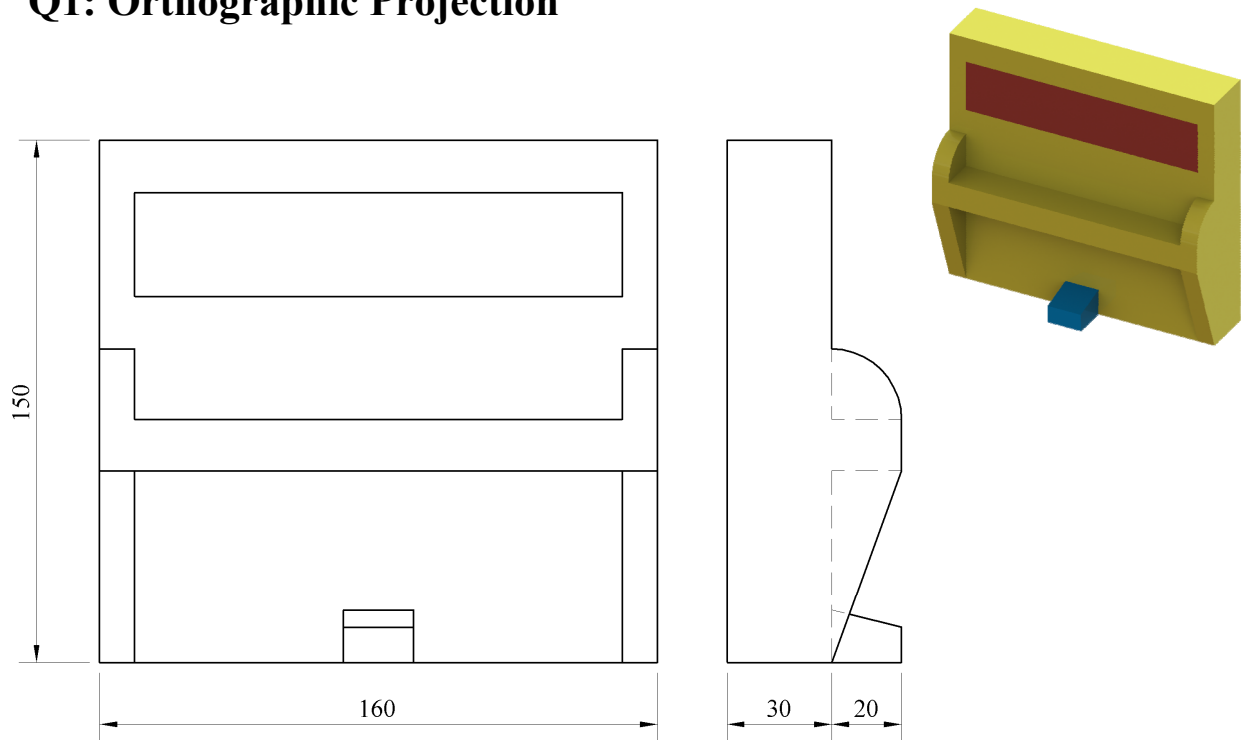
Marking Scheme
Sections A and B

Section A - Any ten questions from this section

Q1	2 10	Any 2 Projection lines from End View (2 marks) Elevation – 5 lines – (5 x 2 marks) (-1 mark if hidden detail is not shown)
Q2	8 4	For a good quality, well proportioned freehand pictorial sketch (5 marks for average quality or rule used) For colour or shading
Q3	6 6	Correct device – SD card (6 marks) Correct use (6 marks)
Q4	2 2 5 3	Arcs – (2 x 1 mark) Vertical construction lines (2 x 1 mark) Diamond outline – 5 lines (5 x 1 mark) Internal lines of diamond
Q5	4 2 6	Correct location of F and F1 (2 x 2 marks) Bisection of angle for tangent (2 marks) Drawing line PQ, horizontal and vertical lines (3 x 2 marks)
Q6	8 4	8 lines - (8 x 1marks) For colour or shading
Q7	12	24 – 26 sq. units = 12 marks (23 or 27 = 6 marks)
Q8	6 6	A = 1300 mm (6 marks) B = 400 mm (6 marks)
Q9	8 4	Elevation of blocks – 4 rows 2 marks for each correct row (-1 mark each row incorrect) Good proportion
Q10	8 2 2	Location of centre (4 marks) Drawing arc (4 marks) Location of point of contact (2 marks) Drawing horizontal line (2 marks)
Q11	12	Any two commands (2 x 6 marks) Mirror, Extrude boss/base, Chamfer
Q12	12	Shade four columns (4 x 3 marks)
Q13	12	Drawing octagon – 4 lines (4 x 3marks) (-2 marks for each line incorrect)
Q14	12	6 lines – 2 marks per line (6 x 2 marks) (-1 mark each line incorrect)
Q15	4 6 2	2 Horizontal projectors and distances (2 x 2 marks) 4 lines (4 x 1 mark), circle (2 marks) For colour or shading
Total 120		

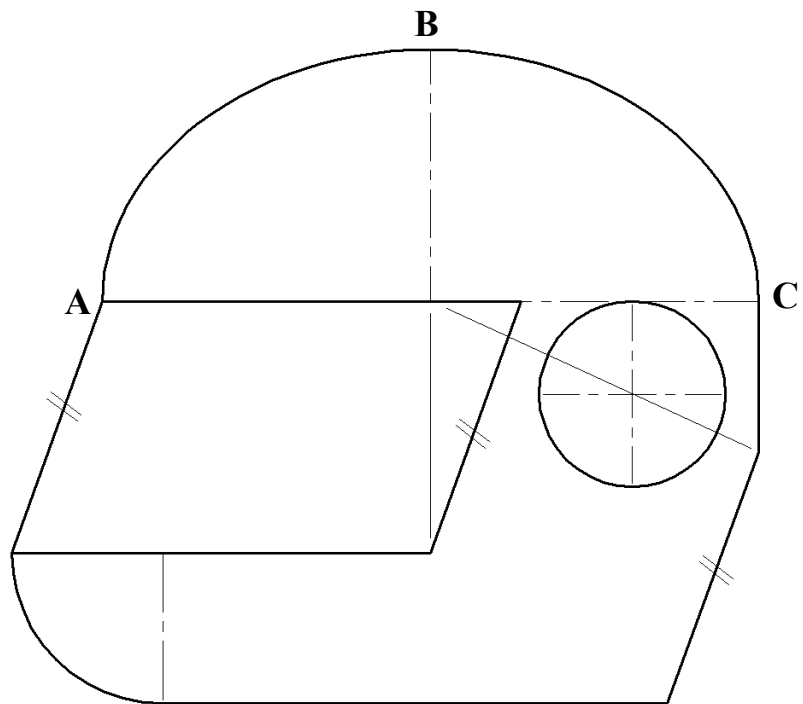
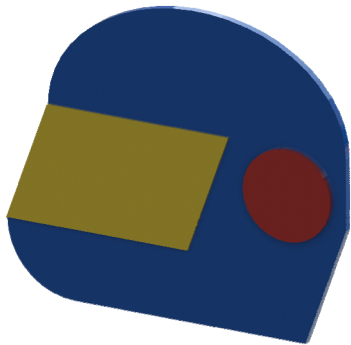
Section B – Any **four** questions from this section

Q1: Orthographic Projection



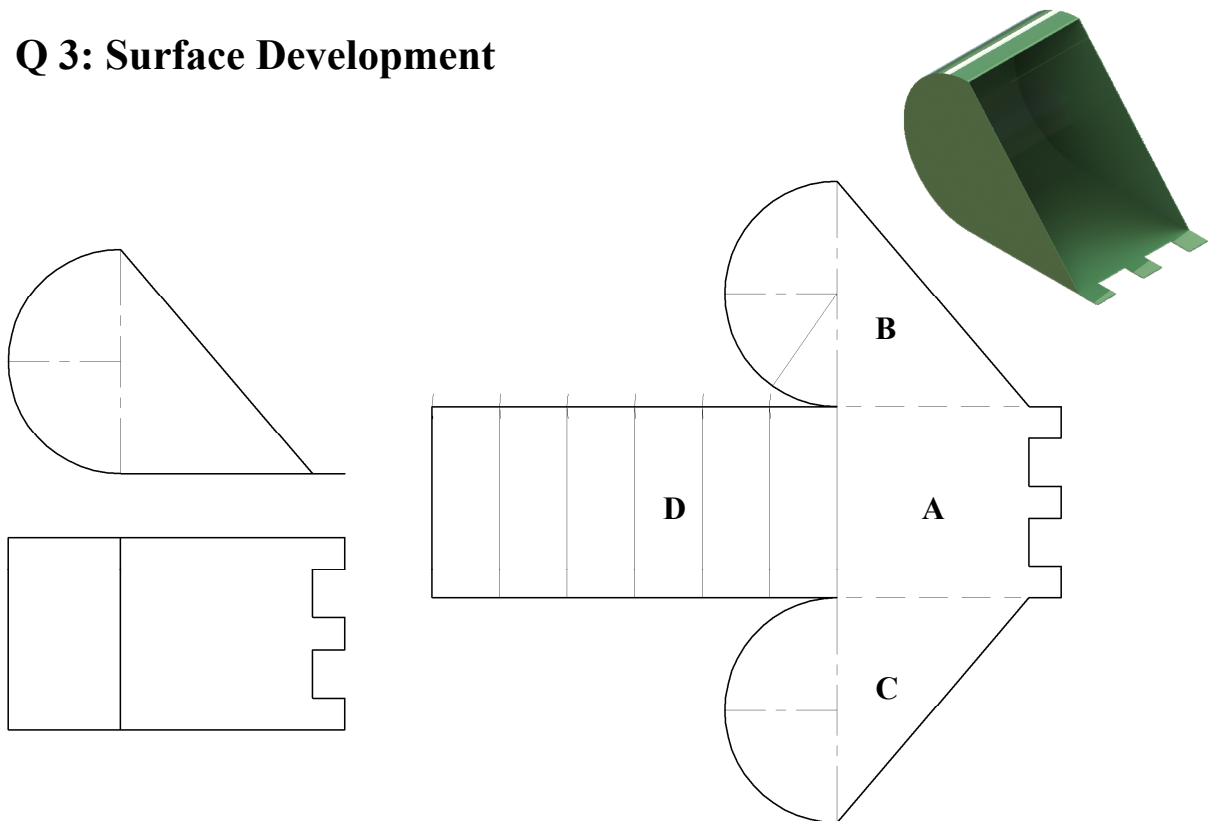
Orthographic Outline (10)	
10	Elevation and End View positioned correctly (4 marks if End View is incorrectly positioned, 1 view = 3 marks)
Elevation (22)	
4	Piano outline – 4 lines (4 x 1 mark)
10	5 horizontal lines (5 x 2 marks)
4	2 vertical lines (2 x 2 marks)
4	Foot pedal – 4 lines (4 x 1 mark)
End View (22)	
16	Piano outline – 6 lines (6 x 2 mark), quadrant (4 marks)
3	Foot pedals – 3 lines (3 x 1 mark)
3	Hidden detail – 5 lines (3 marks)
Dimension lines (4)	
4	1 mark per dimension (4 x 1 mark)
(12)	Drafting, accuracy and presentation
Total 70	

Q 2: Ellipse



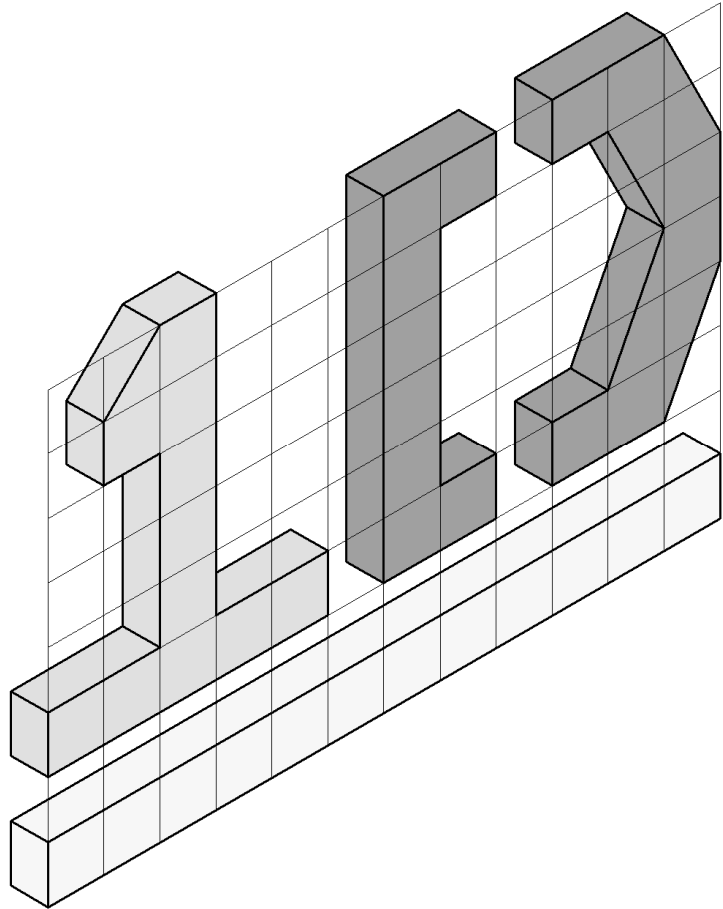
Ellipse construction (28)	
10	Ellipse; Major AC; semi-minor BO – (2 x 5 marks)
10	Construction for ellipse (incorrect application = 4 marks)
8	Drawing curve of ellipse ABC (8,6,4, depending on quality)
Helmet base (30)	
10	Visor - 3 lines (3 x 2 marks), parallel line (4 marks)
14	Base outline – 2 lines (2 x 3 marks), parallel line (4 marks) and quadrant (4 marks)
6	Circle position and construction (2 x 3 marks),
(12)	Drafting, accuracy and presentation
Total 70	

Q 3: Surface Development



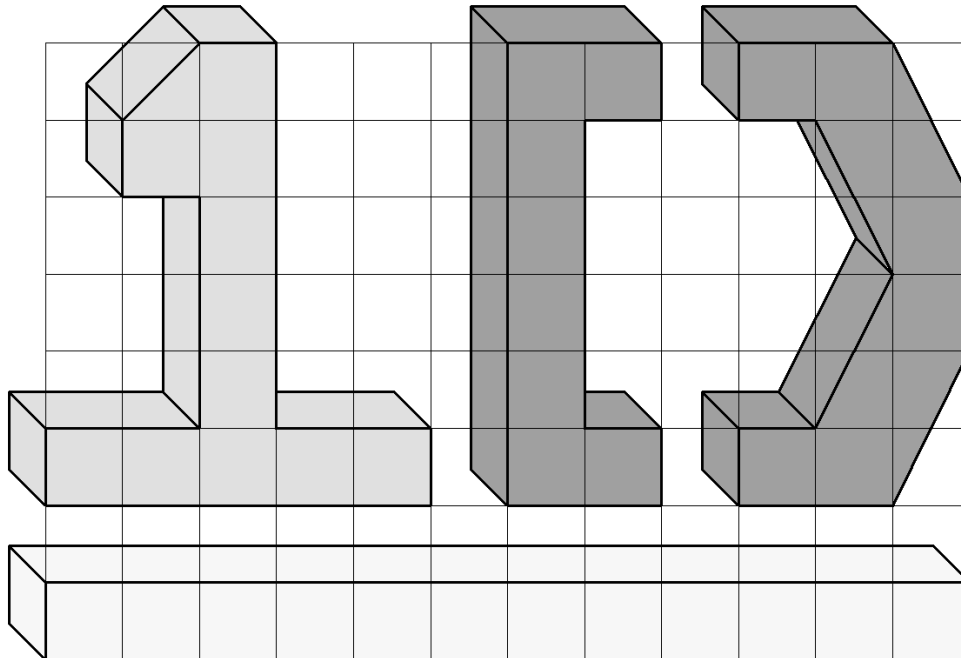
Orthographic (20)	
4	Elevation and Plan in correct position (Plan in wrong location or 1 view = 2 marks)
7	Elevation: Semi-circle (4 marks) , 1 line (1 mark) sloping line (2 marks)
9	Plan: outline - 5 lines (5 x 1 marks) , teeth (4 marks)
Development (38)	
12	Base A – 4 lines (4 x 2 mark) , teeth (4 marks)
14	Side B + C – sloping line (3 marks) and semi-circle (4 marks)
4	Construction for finding correct length of side D (4 marks)
6	Side D – 3 lines (3 x 2 mark)
2	Fold lines (2 x 1 marks)
(12)	Drafting, accuracy and presentation
Total 70	

Q 4: Isometric Projection



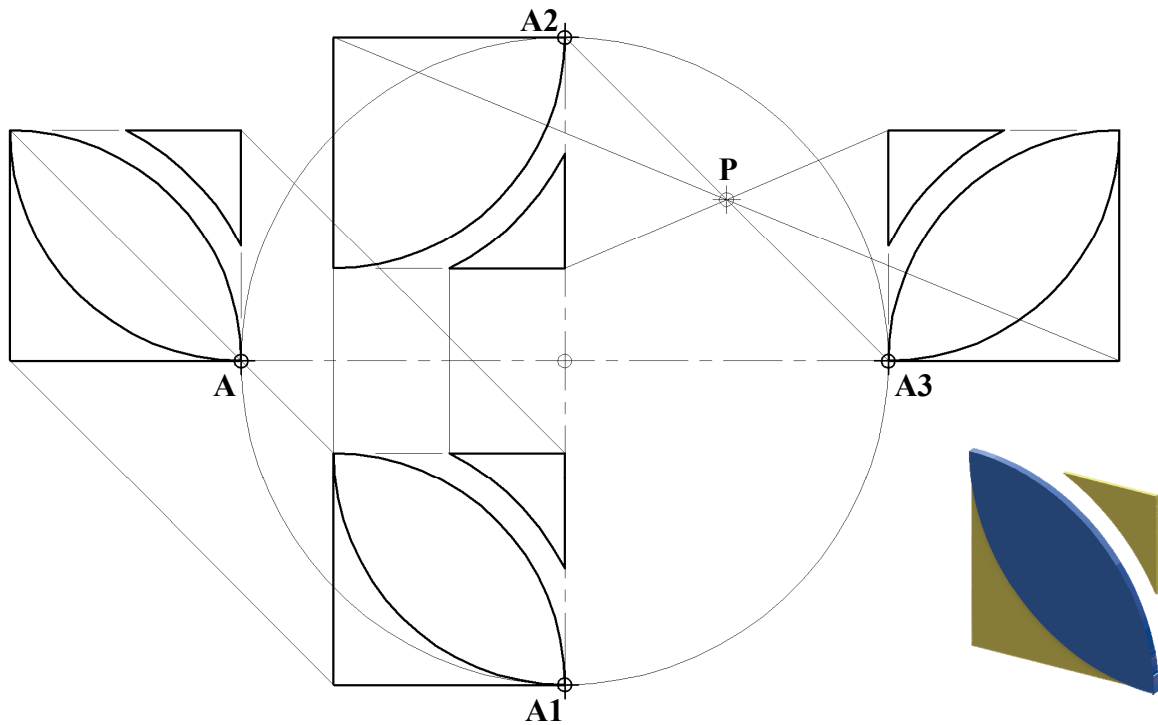
Setting Up (16)	
12	Height, length and width of grid (3 × 4 marks) (deduct 2 each if inaccurate)
4	Isometric outline (deduct 3 + 3 if 30° angles are not used)
Front Face (24)	
4	Base line – 4 lines (1 mark each)
11	Number 1 – 11 lines (1 mark each)
9	Letter D - 19 lines (half mark each line)
Complete width (18)	6 marks per element, Base line, Number 1 and Letter D (4 marks per element if all lines are not put in)
(12)	Drafting, accuracy and presentation
Total 70	

Q 4: Oblique Projection



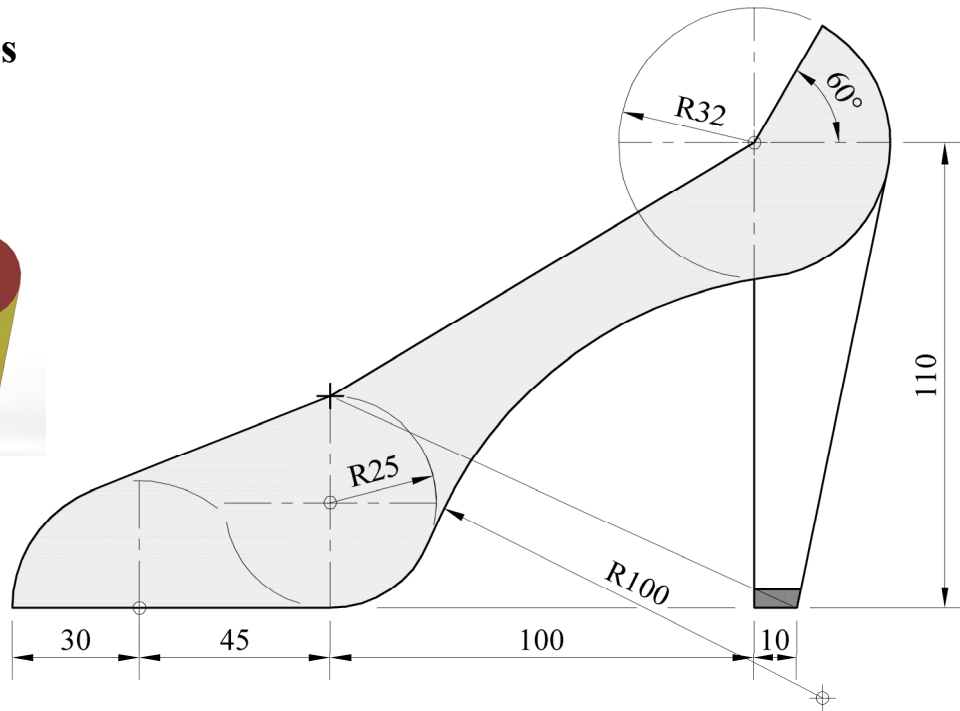
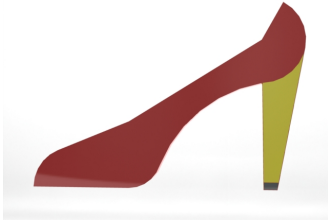
Setting Up (16)	
12	Height, length and width of grid (3 x 4 marks) (deduct 2 each if inaccurate)
4	Oblique outline (deduct 4 marks if 45° angle is not used)
Front Face (24)	
4	Base line – 4 lines (1 mark each)
11	Number 1 – 11 lines (1 mark each)
9	Letter D - 19 lines (half mark each line)
Complete width (18)	6 marks per element, Base line, Number 1 and Letter D (4 marks per element if all lines are not put in)
(12)	Drafting, accuracy and presentation
Total 70	

Q 5: Transformation Geometry



Setting Up (16)	
10	Draw given logo: 4 lines (4 x 1 mark), 3 arcs (3 x 2 marks),
4	Locate points A, A1, A2, A3 (4 x 1 mark)
2	Locate point P
Translation (14)	
4	Projection parallel to A-A1 (correct position and orientation)
10	Drawing rugby logo
Axial Symmetry (14)	
4	Projection lines perpendicular to A-A3 (correct position and orientation)
10	Drawing rugby logo
Central Symmetry (14)	
4	Drawing lines through centre of point P (correct position and orientation)
10	Drawing rugby logo
(12)	Drafting, accuracy and presentation
Total 70	

Q6: Circles



Outline Constructions (20)	
6	R30 circle (6 marks)
7	R25 circle and position (5 marks + 2 marks)
7	R32 circle and position (5 marks + 2 marks)
Shoe Upper (23)	
9	Front tangent; construction (5 marks) Tangent line (4 marks)
10	R100 arc – centre location construction (4 marks), points of contact (2 x 1 mark), arc (4 marks)
4	Complete shoe upper – 2 lines (2 x 2 marks)
Heel (15)	
9	Complete heel back: tangent construction (5 marks) Tangent line (4 marks)
6	Complete heel: vertical (2 marks), horizontal (2 marks), tip (2 marks)
(12)	Drafting, accuracy and presentation
Total 70	