



GCE A LEVEL MARKING SCHEME

SUMMER 2025

**A LEVEL
GEOLOGY – COMPONENT 1
A480U10-1**

About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

EDUQAS GCE A LEVEL GEOLOGY
COMPONENT 1 - GEOLOGICAL INVESTIGATIONS
SUMMER 2025 MARK SCHEME

Specimen G = Barite
Specimen C = Dolerite
Specimen D = Trilobite (*Dalmanites*)
Specimen F = Schist

Instructions for examiners of A Level Geology when applying the mark scheme

1 Positive marking

It should be remembered that candidates are writing under examination conditions and credit should be given for what the candidate writes, rather than adopting the approach of penalising him/her for any omissions. It should be possible for a very good response to achieve full marks and a very poor one to achieve zero marks. Worthwhile answers that meet the requirements of the question, but do not appear on the mark scheme are to be given credit.

2 Tick marking

Low tariff questions should be marked using a points-based system. Each credit worthy response should be ticked in red pen. The number of ticks must equal the mark awarded for the sub-question. The mark scheme should be applied precisely using the marking details box as a guide to the responses that are acceptable. Do not use crosses to indicate answers that are incorrect.

3 Annotated diagrams

Where a candidate has answered a question wholly or partly by use of an annotated diagram, credit must be awarded to the annotations which form credit-worthy responses as outlined in the marking details box. Candidates must be credited only once for valid responses which appear both as annotations to diagrams and within a section of prose in the answer to the same question.

4. Banded mark schemes

Banded mark schemes are divided so that each band has a relevant descriptor. The descriptor for the band provides a description of the performance level for that band. Each band contains marks. Examiners should first read and annotate a learner's answer to pick out the evidence that is being assessed in that question. **Do not use ticks** on the candidate's response. Once the annotation is complete, the mark scheme can be applied. This is done as a two-stage process.

Stage 1 – Deciding on the band

When deciding on a band, the answer should be viewed holistically. Beginning at the lowest band, examiners should look at the learner's answer and check whether it matches the descriptor for that band. Examiners should look at the descriptor for that band and see if it matches the qualities shown in the learner's answer. If the descriptor at the lowest band is satisfied, examiners should move up to the next band and repeat this process for each band until the descriptor matches the answer.

If an answer covers different aspects of different bands within the mark scheme, a 'best fit' approach should be adopted to decide on the band and then the learner's response should be used to decide on the mark within the band. For instance if a response is mainly in band 2 but with a limited amount of band 3 content, the answer would be placed in band 2, but the mark awarded would be close to the top of band 2 as a result of the band 3 content.

Examiners should not seek to mark candidates down as a result of small omissions in minor areas of an answer.

Stage 2 – Deciding on the mark

Once the band has been decided, examiners can then assign a mark. During standardising (marking conference), detailed advice from the Principal Examiner on the qualities of each mark band will be given. Examiners will then receive examples of answers in each mark band that have been awarded a mark by the Principal Examiner. Examiners should mark the examples and compare their marks with those of the Principal Examiner.

When marking, examiners can use these examples to decide whether a learner's response is of a superior, inferior or comparable standard to the example. Examiners are reminded of the need to revisit the answer as they apply the mark scheme in order to confirm that the band and the mark allocated is appropriate to the response provided.

Indicative content is also provided for banded mark schemes. Indicative content is not exhaustive, and any other valid points must be credited. In order to reach the highest bands of the mark scheme a learner need not cover all of the points mentioned in the indicative content but must meet the requirements of the highest mark band. Where a response is not creditworthy, that is contains nothing of any significance to the mark scheme, or where no response has been provided, no marks should be awarded.

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
1	(a)	(i)	110°C (accept 105 to 115) (must have units)	1			1	1	1
		(ii)	40 million years (accept 32 to 50)	1			1	1	1
		(iii)	The longer hydrocarbon chains get cracked into smaller hydrocarbons	1			1		
	(b)	(i)	Jurassic Clay Cretaceous Chalk Palaeogene Clay		3		3		
		(ii)	Sea/marine (1) Tropical (1)	2			2		
		(iii)	Any two x (1) from: - halite is less dense than chalk / clay / sandstone - so rises up due to buoyancy as a salt dome - halite is ductile / able to flow		2		2		
	(c)	(i)	Seismic reflection survey (1)	1			1		
		(ii)	Trap type: anticline / salt dome / unconformity (1) Arrow drawn at crest of anticline/ side of salt dome/ base of unconformity, must match type of trap selected (1) Explanation of trap (1)		3		3		3

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
	(d)		Any three x (1) from: • microfossils survive the drilling process • microfossil species can be zone fossils • microfossils enable biozones / biostratigraphy to be established • correlation can be done between boreholes • microfossils found in different boreholes can be compared • microfossils change colour with heat / depth of burial • thermal change can indicate if oil bearing strata has been buried too deep / not deep enough for oil and gas formation • microfossils can be used to interpret env of deposition of beds which may reveal beds which may be oil bearing	3			3		
			Question 1 total	9	8	0	17	2	5

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
2	(a)		Brachiopod (1) Valves are different sizes / plane of symmetry bisects each valve / foramen (1)		2		2		
	(b)	(i)	15° (accept 10 to 20)		1		1	1	1
		(ii)	Any four x (1) from: - find maximum angle of dip using water or by finding the perpendicular bearing / direction to strike - dip amount measured using a clinometer - by measuring the maximum angle between the bedding planes and the horizontal - dip direction / strike direction measured using a compass - by measuring the compass bearing in which the beds are dipping	4			4		4
	(c)		Indicative Content Initial deposition of Rock Unit 1 Folding and uplift of Rock Unit 1, which would have taken millions of years Erosion of Rock Unit 1, which would have taken millions of years Deposition of Rock Unit 2, after a gap in time since the deposition of Rock Unit 1 Creating an unconformity Folding of Rock Unit 2 Erosion of Rock Unit 2 Reference to the principle of Uniformitarianism, “the present is the key to the past” Link between modern day rates of erosion and rock deformation to the past		6		6		

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
			5-6 marks Deposition, Folding and Erosion are all well explained. Reference is made to either the rate of modern geological processes and/or the Principle of Uniformitarianism <i>There is a sustained line of reasoning which is coherent, substantiated and logically structured. The information included in the response is relevant.</i> 3-4 marks Two of Deposition, Folding and Erosion are clearly explained. Reference is made to uniformitarianism and time. Or Deposition, Folding and Erosion are all well explained but there is no reference to time or the principle of uniformitarianism <i>There is a line of reasoning which is partially coherent, supported by some evidence and with some structure. Mainly relevant information is included but there may be some irrelevant information or minor errors</i> 1-2 marks Reference is only made to either rock cycle processes or uniformitarianism <i>There is a basic line of reasoning which is not coherent, supported by limited evidence and with very little structure. There may be significant errors or the inclusion of much irrelevant information.</i> 0 marks No attempt made or no response worthy of credit.						
			Question 2 total	4	9	0	13	1	5

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
3	(a)		Scale (1) Shape (1) Tri-lobed (1) Detail (2) marks if all of eyes, genal spines, aprx number of thoracic segments drawn and spine on pygidium drawn or Detail (1) mark if 2 or 3 of eyes, genal spines, aprx number of thoracic segments drawn and spine on pygidium drawn		5		5	1	5
	(b)		Dalmanites (1)		1		1		1
	(c)		Benthonic (or equivalent) (1) Any two x (1) from: • eyes on top of head suggest crawler • genal spines suggest rested on seabed • small pygidium suggests non-swimmer • large number of thoracic segments suggest crawler / enable rolling • crescent shaped eyes suggest it is prey		3		3		3
			Question 3 total	0	9	0	9	1	9

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
4	(a)		Mann-Whitney U (1) Any one x (1) from: - data does not involve pairs - data is continuous not categoric - there is a difference between the number of data points in each set / non-parametric test		2		2	2	2
	(b)		Any three x (1) from: - fossils at Locality 1 have a narrower range suggesting statement is true - as fossils at Locality 1 have been sorted during transport - fossils at Locality 2 have a wider range and this may represent juveniles and older individuals in life assemblage, suggesting statement is true - fossils at Locality 2 have a lower % of unbroken fossils suggesting statement is false - as fossils at Locality 2 have been eroded/broken during transport If not scored 3 max from the points above credit any one x (1) from: In order to evaluate this statement you would need to determine: - the orientation of the fossils - if other species are present - the size of area sampled - details of sedimentary rocks in which fossils are found - whether the sample size was sufficient			3	3	2	3
			Question 4 total	0	2	3	5	4	5

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
5	(a)		Dolerite (1) Medium crystal size / size quoted 1-3mm (1) Contains mafic minerals (accept named olivine or augite) / dark in colour (1)		3		3	1	3
	(b)		Any three x (1) from: - It is an intrusion / pluton - Specimen C has medium sized crystals so is intrusive / did not cool at the Earth's surface - a lava flow would cool quickly and have fine crystals, Specimen C does not have fine crystals. - Rock Unit C is discordant so is more likely to be a pluton - Rock Unit C could be a lava flow if it is younger than the rocks beneath - dolerite could be the chilled margin of a pluton			3	3		
			Question 5 total	0	3	3	6	1	6

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
6			Indicative Content see table below			9	9		9
			What	How	Why				
			Chilled Margin in Rock Unit C	Measure crystal size at locations perpendicular to the contact.	Increasing crystal size away from the contact would indicate that Rock Unit C is younger than Rock Unit A				
			Included fragments	Look for the presence of fragments of Rock Unit C in Rock Unit A and vice-versa	Evidence of included fragments of Rock Unit A in Rock Unit C would indicate that Rock Unit A is older than Rock Unit C				
			Baked margin/ metamorphic aureole in Rock Unit A	Look for evidence of recrystallisation/ contact metamorphism more than look form e.g. new minerals, texture etc	Evidence of baked margin/metamorphic aureole in Rock Unit A would indicate that Rock Unit C has metamorphosed Rock Unit A, so is younger than Rock Unit A				
			Interdigitation Mineral veins too	Look for off shot dykes of Rock Unit C penetrating Rock Unit A	Presence of off shot dykes would indicate that Rock Unit C was younger than Rock Unit A				
			Cross cutting relationship between contact and bedding	Look to see if the bedding stops at the contact	Bedding stopping against the contact would indicate Rock Unit C was younger				
			Deformation of bedding in Rock Unit A by Rock Unit C	Measure dip angles and direction within Rock Unit A	If bedding in Rock Unit A is deformed then Rock Unit C is younger				
			Weathering of Rock Unit C along the contact with Rock Unit A	Look for evidence of a weathered/eroded surface	Presence of a weathered/eroded surface would indicate the Rock Unit A is younger				

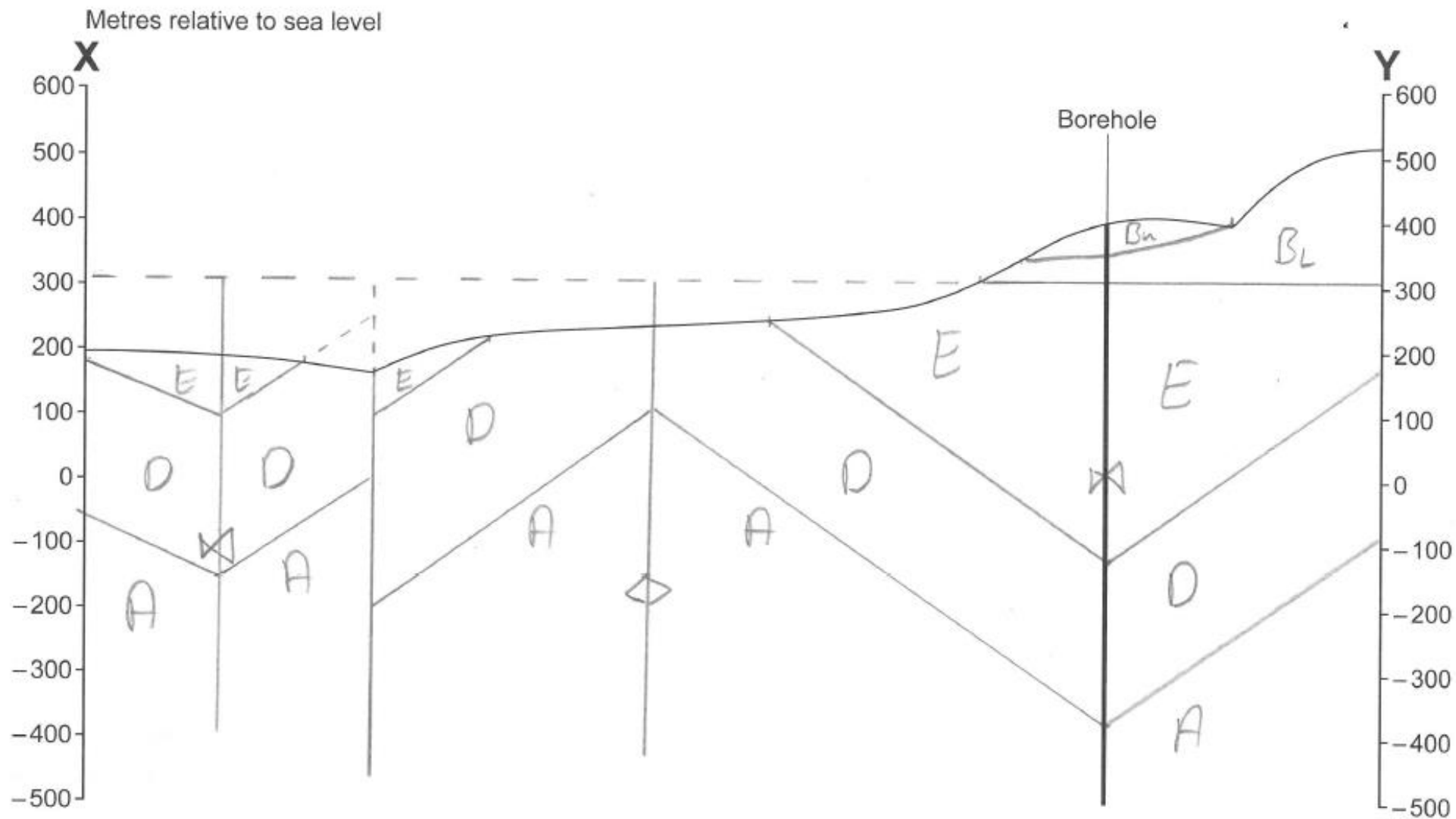
Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
			7–9 marks The response is well-structured. At least 3 different pieces of evidence (what) are discussed. Most are well justified (why) and described (how) showing that the candidate has a clear rationale as to why the observations that have been proposed will enable the relative age to be determined. <i>There is a sustained line of reasoning which is coherent, substantiated and logically structured. The information included in the response is relevant.</i> 4–6 marks The response is quite well-structured. At least 2 different pieces of evidence (what) are discussed. Many but not all of the observations/measurements are justified (why) and described (how) appropriately, showing that the candidate has a reasonable rationale for many of the observations / techniques that have been proposed. <i>There is a line of reasoning which is partially coherent, supported by some evidence and with some structure. Mainly relevant information is included but there may be some irrelevant information or minor errors.</i> 1–3 marks The response makes use of at least 1 appropriate measurement/observation (what) but most of the observations / suggested are not appropriate with regards to investigating relative age of rocks. Justification (why) for the observations is limited revealing that the candidate has a limited rationale for the observations/techniques proposed. <i>There is a basic line of reasoning which is not coherent, supported by limited evidence and with very little structure. There may be significant errors or the inclusion of much irrelevant information.</i> 0 marks No attempt made or no response worthy of credit.						
			Question 6 total	0	0	9	9	0	9

Question			Marking details		Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
7	(a)	(i)		Vitreous/pearly (1)						
			Heft mineral by seeing if it feels heavy for its size (1)	Feels heavy for its size/ has a high density. (1)						
			or	Ignore quoted value of 4.5						
			Look for cleavage planes	2 planes of cleavage at 90°						
			or							
			Observe crystal shape	Bladed crystals						
		(ii)	Barite (1)			1		1		1
	(b)		Location 4 is a fault (1)							
			Any two x (1) from: • water is able to move through faults • Locality 4 is near a pluton / water is heated • hot water / hydrothermal fluids contain dissolved minerals • hot water cools and precipitates on the fault walls				3	3		
			Question 7 total		0	4	3	7	0	4

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
8	(a)	(i)	Quoted appropriate crystal size (numerical values) (1) Foliated/ schistose (1) Equicrystalline or equivalent/ crystalline (1)	3			3	1	3
		(ii)	Any one x (1) from: • mica • garnet • quartz • feldspar		1		1		1
	(b)		Formed from regional metamorphism because of foliation / it is schist (1) Not limestone because it is not marble / does not contain calcite / does not fizz with dilute HCl / contains silicate minerals (1) Medium grade not high grade because it is schist / not gneiss / not gneissose banding Has undergone burial to a greater depth than 100m because needs higher T and P in order to form new minerals / schistose texture (1)			4	4		
			Question 8 total	3	1	4	8	1	4

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
9			Both APT's in rocks to the North of F2 in correct place (1) APT's drawn in rocks to the North of F2 correct length i.e. don't extend into the pluton or cross the unconformity or fault F1 (1) Synform correctly identified within Rock Unit F and APT within Rock Unit F approx.NE-SW (1)		3		3	3	3
			Question 9 total	0	3	0	3	3	3

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
10			Correct surface plots and dip direction of D/E boundary (either side of fault) (1)		1				
			Correct surface plots and dip direction of D/E boundary nearer Y (1)		1				
			Correct apparent dip angle (35° using borehole data) of D/E boundary (1)			1			
			Correct surface plot of fault (1)		1				
			Correct dip angle of fault (1)			1			
			Correct surface plot of base of B (1)		1				
			Correct dip angle of base of B (1)			1	14	14	14
			Correct surface plots of subdivision boundary within B (1)		1				
			Use of borehole data for subdivision boundary (1)			1			
			Correct thickness and depth of D from borehole data (1)			1			
			A synform and antiform correctly located (1)			1			
			Correct symbols on fold axes drawn, must have drawn at least two axes (1)			1			
			All drawn fold axes vertical (allow 5 degrees from vertical) (1)			1			
			Any cross-cut above the surface (1)			1			
			Question 10 total	0	5	9	14	14	14



Question			Marking details	Marks Available																				
				AO1	AO2	AO3	Total	Maths	Prac															
11	(a)		Any two x (1) from: - as strain increases stress increases - it is linear up to point J, non-linear beyond J - it is a proportional relationship up to point J	2			2		2															
	(b)		Elastic (1) Plastic (1)	2			2																	
	(c)		For Point J Block drawn with identical height and width to unstrained rock, no fractures present (1) For Point K Block drawn showing deformation, smaller than unstrained rock but taller than fractured rock (1) Block drawn wider in the middle than the unstrained rock (1)			3	3		3															
	(d)	(i)	<table><tr><td></td><td></td><td></td></tr><tr><td>O to J</td><td></td><td></td></tr><tr><td>J to K</td><td></td><td></td></tr><tr><td>K to L</td><td></td><td></td></tr><tr><td>At point L</td><td>✓</td><td></td></tr></table> Do not credit if more than 1 box ticked in Location 5 column				O to J			J to K			K to L			At point L	✓				1	1		1
O to J																								
J to K																								
K to L																								
At point L	✓																							

Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
		(ii)	Location 5 is a fault formed by brittle deformation where the strain exceeded the fracture point (1) Location 6 is a fold formed by plastic / ductile deformation where the strain exceeded the elastic limit but not the fracture point (1)			2	2		2
	(e)		Any two x (2) from: • temperature (1), Location 5 was colder (1) • depth (1), Location 6 was deeper (1) • time (1), strain was applied faster at Location 5 (1) • stress(1), greater stress applied at Location 5 (1) • confining pressure (1), confining pressure greater at Location 6 (1) Credit reference the role of fluids		4		4		
			Question 11 total	4	4	6	14	0	8
			Paper Totals	20	48	37	105	27	72