



National
Qualifications
2023

2023 Geography

Physical and Human Environments

Higher

Finalised Marking Instructions

© Scottish Qualifications Authority 2023

These marking instructions have been prepared by examination teams for use by SQA appointed markers when marking external course assessments.

The information in this document may be reproduced in support of SQA qualifications only on a non-commercial basis. If it is reproduced, SQA must be clearly acknowledged as the source. If it is to be reproduced for any other purpose, written permission must be obtained from permissions@sqa.org.uk.



General marking principles for Higher Geography

Always apply these general principles. Use them in conjunction with the detailed marking instructions, which identify the key features required in candidates' responses.

- (a) Always use positive marking. This means candidates accumulate marks for the demonstration of relevant skills, knowledge and understanding; marks are not deducted for errors or omissions.
- (b) If a candidate response does not seem to be covered by either the principles or detailed marking instructions, and you are uncertain how to assess it, you must seek guidance from your team leader.
- (c) Where the candidate does not comply with the rubric of the paper and answers two parts in one section, mark both responses and record the better mark.
- (d) Marking must be consistent. Never make a hasty judgement on a response based on length, quality of handwriting or a confused start.
- (e) Use the full range of marks available for each question.
- (f) The detailed marking instructions are not an exhaustive list. Award marks for other relevant points.
- (g) Award marks only where points relate to the question asked. Where candidates give points of knowledge without specifying the context, award marks unless it is clear that they do not refer to the context of the question.
- (h) Award marks for knowledge/understanding where points are:
 - relevant to the issue in the question
 - developed (by providing additional detail, exemplification, reasons or evidence)
 - used to respond to the demands of the question (for example evaluate, analyse).

Marking principles for each question type

There is a range of question types in this question paper. For each question type, the following provides an overview of marking principles, and an example.

Describe questions

Candidates gain marks for making relevant, factual points. These should be key points. The points do not need to be in any particular order. Candidates may provide a number of straightforward points or a smaller number of developed points, or a combination of these. Candidates must provide more than an outline or list to gain marks. They could refer to, for example, a landscape feature, a landscape formation process, a situation or facts demonstrating geographical knowledge.

Explain questions

Candidates gain marks for explaining or suggesting reasons for the cause or impact of something, or for referring to causal connections and relationships. Candidates must do more than describe to gain marks here.

- Where the question asks about a landscape feature, candidates should refer to the processes leading to landscape formation.
- For a source-based question, candidates should make use of these and refer to them within their answer for full marks.

Where candidates provide a purely descriptive answer, or one where development is limited, award no more than half the available marks for the question. Other questions look for candidates to demonstrate higher-order skills and will use command words such as analyse, evaluate, to what extent, and discuss.

Analyse questions

Candidates gain marks for identifying parts, the relationship between them, and their relationships with the whole; and for drawing out and relating implications. Award an analysis mark where candidates use their knowledge and understanding or a source to identify relevant components (for example of an idea, theory, argument) and clearly show at least one of the following:

- links between different components
- links between component(s) and the whole
- links between component(s) and related concepts
- similarities and contradictions
- consistency and inconsistency
- different views or interpretations
- possible consequences or implications
- the relative importance of components
- understanding of underlying order or structure.

Where candidates are asked to analyse they should identify parts of a topic or issue and refer to the interrelationships between, or impacts of, various factors. For example, where a question asks for an analysis of the soil-forming properties which lead to the formation of a gley soil, candidates should refer to how the various soil formatting properties contributed to its formation.

Evaluate questions

Candidates gain marks for making a judgement of the success, failure, or impact of something based on criteria. They should give a brief description of the strategy or project being evaluated, before offering an evidenced conclusion.

Account for questions

Candidates gain marks for giving reasons which are often (but not exclusively) from a resource, for example: for a change in trade figures; a need for water management; or differences in development between contrasting developing countries.

Discuss questions

Candidates gain marks for exploring ideas about a project, or the impact of a change. They should consider different views on an issue or argument. This might not be a balanced argument, but they should give a range of impacts or ideas within their answer.

To what extent questions

Candidates gain marks for considering the impact of a management strategy or strategies they have explored. They should give a brief description of the strategy or project being evaluated, before offering an evidenced conclusion. They do not need to offer an overall opinion based on a variety of strategies, but should assess each separately.

Marking instructions for each question

Section 1 – Physical Environments

Question			General marking principle for this type of question	Max mark	Specific Marking Instructions for this question
1.			<p>Check any diagram(s) for relevant points not present in the text and award marks accordingly. Candidates can gain full marks for well-annotated diagrams that explain the formation of a ribbon lake.</p> <p>Award a maximum of 1 mark where candidates provide a list of unexplained processes with at least two processes required for this mark.</p> <p>Award a maximum of 4 marks where candidates provide two fully developed processes (up to 2 marks per developed process). A mark for a named process should only be awarded if the candidate develops this in some way.</p> <p>Award a maximum of 2 marks for the formation of a glacier. Award a maximum of 1 mark for a correctly named example of a ribbon lake.</p> <p>Award a maximum of 7 marks for answers which do not develop past the development of a U-shaped valley.</p>	8	<p>Points may include:</p> <p>Glacier formation includes:</p> <ul style="list-style-type: none"> • snow accumulates in north facing hollows (1 mark) when more snow falls in winter than melts in the summer (1 mark) • north/north-east facing slopes are more shaded so snow lies longer (1 mark) with accumulated snow compressed into névé and eventually ice. (1 mark) <p>Processes include:</p> <ul style="list-style-type: none"> • plucking when ice freezes on to bedrock (1 P mark), pulling loose rocks away from the valley side (1 P mark) • abrasion when the angular rock embedded in the ice (1 P mark) grinds the valley floor as glacier moves (1 P mark) • frost shattering/freeze thaw weathering when water in cracks in the rock freezes (1 P mark), expands and contracts weakening the rock until fragments break off (1 P mark) • the glacier moves downhill due to gravity/weight (1 mark) • former interlocking spurs may be cut off by glacier (1 mark) resulting in steep crags or truncated spurs (1 mark) • ribbon lakes can form where softer bedrock is eroded more deeply than the surrounding area (1 mark) • ribbon lakes can form where a terminal or recessional moraine creates a dam (1 mark) • an example is Loch Muick. (1 EG mark) <p>Or any other valid point.</p>

Question			General marking principle for this type of question	Max mark	Specific Marking Instructions for this question
2.			<p>Check any diagram(s) for relevant points not present in the text and award marks accordingly. Candidates can gain full marks for well-annotated diagrams that explain the formation of a sand bar.</p> <p>Award a maximum of 4 marks where candidates provide a fully developed explanation of longshore drift.</p> <p>A mark for a named process should only be awarded if the candidate develops this in some way.</p> <p>Award a maximum of 1 mark for a list of unexplained processes with at least two processes required for this mark. Award a maximum of 1 mark for a correctly named example of a sandbar.</p> <p>Award a maximum of 7 marks for answers which do not develop past the formation of a Spit.</p>	8	<p>Points may include:</p> <p>Processes:</p> <ul style="list-style-type: none"> • sand bars are formed by the process of longshore drift which is lateral/zig-zag movement of the waves (1 P mark) • Swash is where waves push material up the beach at an angle (1 P mark) due to the prevailing wind (1 P mark) • the returning backwash is dragged back down the beach at right angles (1 P mark) due to gravity. (1 P mark) <p>Sand Bars:</p> <ul style="list-style-type: none"> • bars form when there is a change in direction on a coastline (1 mark) allowing a sheltered area for deposition (1 mark) material slowly builds up to appear above the water (1 mark) • the bar develops as long as the supply of deposits is greater than the amount of erosion (1 mark) • if a spit reaches the other side of a bay then a sand bar is formed (1 mark) this happens when there is no strong flow of water from a river into the sea (1 mark) enclosing a sheltered lagoon behind it (1 mark), for example, Slapton Sands. (1 EG mark) <p>Or any other valid point.</p>

Question			General marking principle for this type of question	Max mark	Specific Marking Instructions for this question
3.			<p>Candidates must include both descriptions and explanation for full marks.</p> <p>Award a maximum of 5 marks for descriptions.</p> <p>Candidates may answer each command separately or as a holistic answer; award marks accordingly.</p>	10	<p>Points may include:</p> <p>Descriptions may include:</p> <ul style="list-style-type: none"> there is a lag time of sixteen hours (1 A mark) there is a gradual rise in discharge from 17:00 (1 A mark) leading to a peak discharge of 32 cumecs at 05:00 (1 A mark) there is a gentle recession limb from 05:00 until 13:00 (1 A mark) there is a second rising limb which reaches 24 cumecs at 18:00. (1 A mark). <p>Explanations may include:</p> <ul style="list-style-type: none"> the rising limb is caused by the initial rainfall which began at 10:00 (1 B mark) there is a second smaller peak due to a secondary period of rainfall. (1 B mark) <p>The long lag time/gently rising limb may be due to:</p> <ul style="list-style-type: none"> the initial rainfall may have been intercepted by vegetation (1 B mark) likely a rural area with a lack of tarmac increasing infiltration (1 B mark) there may be a low number of tributaries transporting water to the channel slowly (1 B mark) the catchment area may be gently sloping leading to slower initial overland flow to the channel (1 B mark) it may be a large catchment area meaning more travel time to the main channel (1 B mark) there may be porous soils/peaty soils increasing soil storage (1 B mark) there may be permeable rock allowing for increased groundwater storage (1 B mark) the river rises because soil storage has been exceeded. (1 B mark) <p>Or any other valid point.</p>

Question			General marking principle for this type of question	Max mark	Specific Marking Instructions for this question
4.			<p>Check any diagram(s) for relevant points not present in the text and award marks accordingly. Candidates can gain full marks for well-annotated diagrams that explain the formation of a waterfall.</p> <p>Award a maximum of 4 marks where candidates provide two fully developed processes (up to 2 marks per developed process).</p> <p>A mark for a named process should only be awarded if the candidate develops this in some way.</p> <p>Award a maximum of 2 marks for a list of unexplained processes, with at least two processes required for each mark.</p>	8	<p>Points may include:</p> <p>Processes:</p> <ul style="list-style-type: none"> hydraulic action which is when water compresses air (1 P mark) into the riverbank causing materials to be dislodged (1 P mark) abrasion when the force of the water throws bedload (1 P mark) against the banks causing a scouring action (1 P mark) solution when acids in the water (1 P mark) react with soluble bedrock with (1 P mark) attrition when load is thrown against other particles in the water (1 P mark) causing it to become smaller and rounder. (1 P mark) <p>Waterfall:</p> <ul style="list-style-type: none"> differential erosion takes place / soft rock erodes quicker (1 mark) over bands of more and less resistant rock/where harder rock is overlaying softer rock/bands of hard/soft rock (1 mark) undercutting causes an overhang / unsupported rock (1 mark) which collapses into the plunge pool due to gravity (1 mark) the plunge pool can be further deepened by materials from the collapse (1 mark) the waterfall retreats upstream. (1 mark) <p>Or any other valid point.</p>

Question			General marking principle for this type of question	Max mark	Specific Marking Instructions for this question
5.			Maximum of 2 marks for correctly naming any of three cells/winds with location.	8	<p>For the northern hemisphere, answers may include:</p> <ul style="list-style-type: none"> winds are deflected to the right due to the Coriolis Effect (1 mark) which is caused by the spinning of the Earth (1 mark) warm air is distributed to higher / cooler latitudes and cold air is distributed to lower/warmer latitudes (1 mark) the Hadley/Polar Cells are thermally direct (1 mark) and the Ferrel Cell is thermally indirect. (1 mark) <p>Hadley cell:</p> <ul style="list-style-type: none"> warm air rises at the Equator creating low pressure (1 mark) the air splits in the atmosphere and moves towards the poles (1 mark) air cools and sinks at the Tropics / 30° creating high pressure (1 mark) the North East Trade (1 EG mark) winds move air back to the Equator (1 mark) completing the Hadley cell. (1 EG mark) <p>Polar cell:</p> <ul style="list-style-type: none"> cold air sinking at the poles creates a high pressure area (1 mark) the Polar Easterlies (1 EG mark) transfer cold air from the poles to the Polar front/towards the Equator (1 mark) here it meets warmer air from the tropics, causing air to rise (1 mark) air moves back to the Poles in the upper atmosphere (1 mark) completing the Polar Cell. (1 EG mark) <p>Ferrel cell:</p> <ul style="list-style-type: none"> the Ferrel cell is located between 30°N and 60°N (1 EG mark), the Ferrel cell transfers air between the Hadley and Polar cells (1 mark) forming the westerlies. (1 EG mark) <p>Credit should be awarded for answers which refer to the Rossby Waves and/or the Jet Stream.</p> <p>Or any other valid point.</p>

Question	General marking principle for this type of question	Max mark	Specific Marking Instructions for this question
6.	<p>Award a maximum of 6 marks if candidates do not provide an annotated profile.</p> <p>Award a maximum of 6 marks where candidates provide a 'ladder' type diagram (with A, B, and C horizons) and separate text answer.</p>	8	<div data-bbox="1034 279 1294 1077" data-label="Image"> </div> <ul style="list-style-type: none"> • coniferous woodland/heather moorland (1 mark) • layer of needles and cones (1 mark) • black humus (1 mark), mor/acidic humus (1 mark) • some darker staining in upper A horizon (1 mark) • shallow spreading roots (1 mark) • ash grey lower A horizon (1 mark) with sandy texture (1 mark) • iron pan develops in lower A / B horizon (1 mark) impeding drainage (1 mark) Well defined horizons (1 mark), few soil biota (1 mark) • B horizon is reddish brown (1 mark) with denser texture (1 mark) • downward movement of water (1 mark) • C horizon is generally glacial or fluvioglacial material (1 mark) • partially/not well weathered parental material. (1 mark) <p>Or any other valid point.</p>

Section 2 – Human Environments

Question			General marking principle for this type of question	Max mark	Specific Marking Instructions for this question
7.			Award 1 mark for each relevant point.	6	<p>Points may include:</p> <ul style="list-style-type: none"> • census is a survey carried out every 10 years (1 mark) • each householder is legally required to complete a detailed questionnaire (1 mark) • householders answer other questions on their social, economic and cultural background (1 mark) • civil registration of births and deaths (1 mark) provide an up-to-date count between censuses (1 mark) • Scottish Household Survey is a continuous survey (1 mark) based on a random sample of the population (1 mark) which is cheaper than carrying out a full census (1 mark) • governments also collect data on migration, for example visa applications (1 mark) and NHS records provide health data. (1 mark) <p>Or any other valid point.</p>

Question			General marking principle for this type of question	Max mark	Specific Marking Instructions for this question
8.			<p>Award 1 mark for each relevant point.</p> <p>Credit points are specific to youthful growing populations.</p>	10	<ul style="list-style-type: none"> • there will be a much larger potential workforce (1 mark) which may attract multinational companies to the country (1 mark). This may increase tax revenue for the government (1 mark) • due to the increase in the number of people of childbearing ages, the population will continue to increase. (1 mark) This may result in high unemployment (1 mark) • significant investment will be required for maternity hospitals (1 mark) • it will be necessary to build more schools and train more teachers (1 mark) • governments may need to invest in family planning (1 mark) • services such as care for the elderly will be required to support an increasingly ageing population (1 mark) • there may be an increased burden on families to support older relatives (1 mark) • in urban areas pressure on housing may lead to expansion of informal housing (1 mark) • in rural areas pressure on food supplies may increase the risk of malnutrition. (1 mark) <p>Or any other valid point.</p>

Question			General marking principle for this type of question	Max mark	Specific Marking Instructions for this question
9.			<p>Award 1 mark for each relevant point.</p> <p>Award a maximum of 5 marks for either part (a) or part (b).</p> <p>Award a maximum of 1 mark for a specific named example within the chosen city.</p> <p>A maximum of 6 marks should be awarded if the answer does not clearly relate to a specific case study.</p> <p>Candidates may choose to answer this question in two parts or holistically. Marks should be awarded accordingly.</p>	8	<p>For Edinburgh answers may include:</p> <p>In Leith:</p> <ul style="list-style-type: none"> • new tenement style housing with security entry/off street parking has been built (1 A mark) • Damp/anti-social high-rise flats were demolished or upgraded (1 A mark) the 22 storey Cairngorm/Grampian House (1 EG mark) • some new houses were designed with a nautical theme (1 A mark) and other old industrial buildings were repurposed as flats (1 A mark) • improved amenities for local people have been built (1 A mark) For example Ocean Terminal (1 EG mark) • more affordable housing has been provided by local housing associations (1 A mark) Port of Leith Housing Association (1 EG mark) • Old dock areas have had new style higher rise apartment blocks added (1 A mark) • a private health club and new restaurants provide employment opportunities in the area. (1 A mark) <p>Comments on effectiveness may include:</p> <ul style="list-style-type: none"> • Increased house prices have priced original residents out of the market (1 B mark) • the demolition of historic sites have led to campaigning and conflict (1 B mark) including the ‘Save Leith Walk’ campaign. (1 EG mark) which was successful in preventing the demolition of a historic area (1 B mark) • most improvements have been in keeping with the local heritage of the area (1 B mark) • more affluent residents have been attracted to the area which has improved the perception of the area. (1 B mark) <p>Or any other valid point.</p>

Question			General marking principle for this type of question	Max mark	Specific Marking Instructions for this question
10.			<p>Award 1 mark for each relevant point.</p> <p>Award a maximum of 5 marks for either part (a) or part (b).</p> <p>Award a maximum of 1 mark for a specific named example within the chosen city.</p> <p>A maximum of 6 marks should be awarded if the answer does not clearly relate to a specific case study.</p>	8	<p>For Rio, answers may include:</p> <p>Improvements to public transport</p> <ul style="list-style-type: none"> the mayor has announced a 15 year plan to develop a light rail network to replace the BRT (1 A mark) this manages transport by increasing the capacity of the public transport network (1 B mark) the Transcarioca (1 EG mark) connects Barra di Tijuca with the Galeão International Airport which was important for the spectators at the 2016 Olympics (1 A mark). Articulated buses manage transport by increasing passenger numbers which can be carried per bus (1 B mark) the number of cycle lanes across the city has been increased (1 A mark) and Bike Rio/Itaú (1 EG mark) has 3100 bicycles which are available at 310 rental stations across the city (1 A mark) this manages transport by creating a safe alternative to travelling by car (1 B mark) Metro Rio has extended by adding Line 4 which added an extra six stations (1 A mark) this manages transport by relieving pressure on already congested routes towards the CBD (1 B mark) the Yellow Line Expressway (1 EG mark) bypasses the busy city centre. (1 A mark) the government have invested in new toll roads (1 A mark) to help finance new road development to reduce traffic congestion (1 B mark) The Rio-Niteroi bridge (1 EG mark) connects Rio to the commuter area of Niterói/São Gonçalo (1 A mark) this manages transport by reducing pressure on ferry services (1 B mark) Gondolas were added to connect some favelas to the city centre. (1 A mark) <p>Or any other valid point.</p>

Question			General marking principle for this type of question	Max mark	Specific Marking Instructions for this question
11.			<p>Answers will depend on the case study referenced by the candidate.</p> <p>Award 1 mark for each description and 1 mark for each comment on effectiveness.</p> <p>Award a maximum of 7 marks for description including a maximum of 1 mark for an appropriate specific named strategy. Award a maximum of 7 marks for part (b).</p>	10	<p>For rainforest areas:</p> <ul style="list-style-type: none"> • agro-forestry – farmers grow trees and crops at the same time (1 A mark) which reduces soil erosion as the canopy protects the topsoil (1 A mark) the crops benefit from the nutrients from the dead organic matter decomposing (1 A mark). Unfortunately, trees take a long time to grow so the effects will not be immediate (1 B mark) • afforestation projects prevent soil erosion as the tree roots bind the soil (1 A mark) • selective logging – trees are only felled when they reach a particular height/width (1 A mark). This allows young trees a guaranteed life span thus protecting the soil from erosion (1 B mark) This is difficult and time consuming to do so logging companies feel it is not cost-effective (1 B mark) • forest reserves – areas are purchased by conservation groups to protect them from exploitation (1 A mark). This allows indigenous people to practise shifting cultivation which is less destructive to the soil (1 B mark). Biodiverse Labs (Brazil) (1 EG mark) makes use of drone imagery to identify and map species of trees which are economically viable for supporting indigenous population (1 A mark) The Amazon Region Protected Areas (ARPAs) (1 EG mark) by the Brazilian Government however corruption means illegal logging continues (1 B mark) • monitoring – use of satellite technology and photography to check that any activities taking place are legal (1 A mark) and follow guidelines for sustainability reduced deforestation by 60% in Brazil (1 B mark). This is very expensive to do and low-income countries' governments may not have access to this technology. (1 B mark)

Question			General marking principle for this type of question	Max mark	Specific Marking Instructions for this question
					<p>Suitable methods for a semi-arid area may include:</p> <ul style="list-style-type: none"> • afforestation projects provide a barrier to reduce wind erosion (1 A mark) as the tree roots bind the soil and hold it in place (1 A mark) trees take a long time to grow however therefore this strategy is long term (1 B mark). The Great Green Wall (1 EG mark) • Fanya juu terraces (1 EG mark) have been made by digging a drainage channel and throwing soil uphill to make a ridge to increase infiltration (1 A mark) however maintaining these is very labour intensive (1 B mark) • Diguettes or ‘Magic Stones’ are lines of stones placed along the contours of gently sloping land (1 A mark) to promote infiltration (1 A mark) and allows the build-up of fertile topsoil (1 A mark). This is simple technology and involves the whole community which is suitable in low-income countries (1 B mark) • Moveable fencing allows farmers to control grazing / prevent overgrazing (1 A mark) allowing soil to recover at different times of the year (1 A mark). However, this involves villages/tribes having to work together when tensions may already be high (1 B mark). • Education on the reduction of herd sizes reduces the effects of trampling/compaction of already fragile soils (1 A mark). However, farmers are not always keen to do this as they lose valuable cash source (1 B mark) • Zai (microbasins, or planting pits) are hollows dug to retain moisture and nutrients (1 A mark) which increases infiltration/reduces run-off (1 A mark). This ensures year-round plant coverage which protects the soil (1 B mark). This increases the amount of land available for growing crops which in turn reduces farming on marginal lands (1 B mark) • Ripple Africa (1 EG mark) is a charity which has supplied households with a fuel-efficient cook stove (1 A mark). This reduces deforestation as they use less wood for cooking (1 B mark). <p>Or any other valid point.</p>

Question			General marking principle for this type of question	Max mark	Specific Marking Instructions for this question
12.			<p>Award 1 mark for each relevant point</p> <p>If candidates discuss more than one area, mark all and award marks to the highest scoring area.</p> <p>Award a maximum of 1 mark for specific named examples within the chosen area.</p> <p>A maximum of 7 marks should be awarded if the answer does not clearly relate to a specific study area.</p>	8	<p>For the Dorset Coast:</p> <ul style="list-style-type: none"> • traffic congestion on narrow rural roads (1 mark) for example heading to Corfe Castle (1 EG mark) leads to high levels of air and noise pollution (1 mark) • tourists park on grass verges leading to erosion (1 mark) for example Lulworth Cove (1 EG mark) • tourists wander off footpaths widening them (1 mark) for example the South West coastal path (1 EG mark) and stone walls can be damaged by people climbing over them (1 mark) • litter if eaten by wildlife or livestock can harm or kill (1 mark) • tourists leave gates open causing farm animals to escape (1 mark) • dogs off leads can worry sheep leading to miscarriages (1 mark) this will reduce the farmers income due to vet bills / loss of profit (1 mark) • quarrying can also lead to visual pollution in the spectacular landscape (1 mark) for example Swanworth quarry (1 EG mark) • tourists buying second homes pushes prices up for locals (1 mark) and can lead to rural depopulation, (1 mark) which can reduce demand for local services which may close. (1 mark) <p>Or any other valid point.</p>

[END OF MARKING INSTRUCTON]