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91426

914260

NZQA

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

Level 3 Geography, 2017

91426 Demonstrate understanding of how interacting natural processes shape a New Zealand geographic environment

2.00 p.m. Wednesday 22 November 2017
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of how interacting natural processes shape a New Zealand geographic environment.	Demonstrate in-depth understanding of how interacting natural processes shape a New Zealand geographic environment.	Demonstrate comprehensive understanding of how interacting natural processes shape a New Zealand geographic environment.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt the question in this booklet.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–10 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

Merit

TOTAL 06

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INSTRUCTIONS

Use page 3 to identify a **New Zealand geographic environment** that you have studied, and the **interacting natural processes** that shape it; and to plan your response to the question below.

Draw and explain map(s) and/or diagram(s) on page 4 to answer part (a).

Begin your written answer to part (b) on page 5, integrating comprehensive, supporting case study evidence about your New Zealand geographic environment and the interacting natural processes that shape it. You may include relevant map(s) and/or diagram(s) to support your answer as appropriate, and/or refer to the map(s) and/or diagram(s) that you have drawn and explained on page 4.

QUESTION

(a) Draw map(s) and/or diagram(s) that explain how ONE natural process operates in your chosen New Zealand geographic environment.

(b) Comprehensively analyse how the process you have drawn and explained in part (a), interacts with at least one other natural process, to shape a feature(s) in your chosen New Zealand geographic environment.

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New Zealand geographic environment: Kapiti Coast

Interacting natural processes that shape this environment:

erosion, transportation of sediment, longshore drift, & natural break waters & saltation to form a cuspate.

PLANNING (OPTIONAL)

abrasion = when sediments forcefully rub against other rock causing it to erode

corrosion = erosion of rock after coming in contact with fluvial processes such as rain, running water.

summer = brings anticyclones, wind less than 20kmph
Westerly winds help process of saltation
builds up beach profile = steeper (6-10° of slope angle)
summer means "drier beach" sediments can soak into beach, gravitational pull is less so more constructive waves & building up of beach.

winter = brings storm like conditions & rough winds averaging more than 25kmph
results in 2m+ swells & destructive waves
beach is wet so sediments cannot soak into surface so back wash carries with it the sea & most of the sediments back into it
resulting in smaller beach, & less steep beach profile (2-4° of slope angle).

(a) Draw map(s) and/or diagram(s) that explain how ONE natural process operates in your chosen New Zealand geographic environment.

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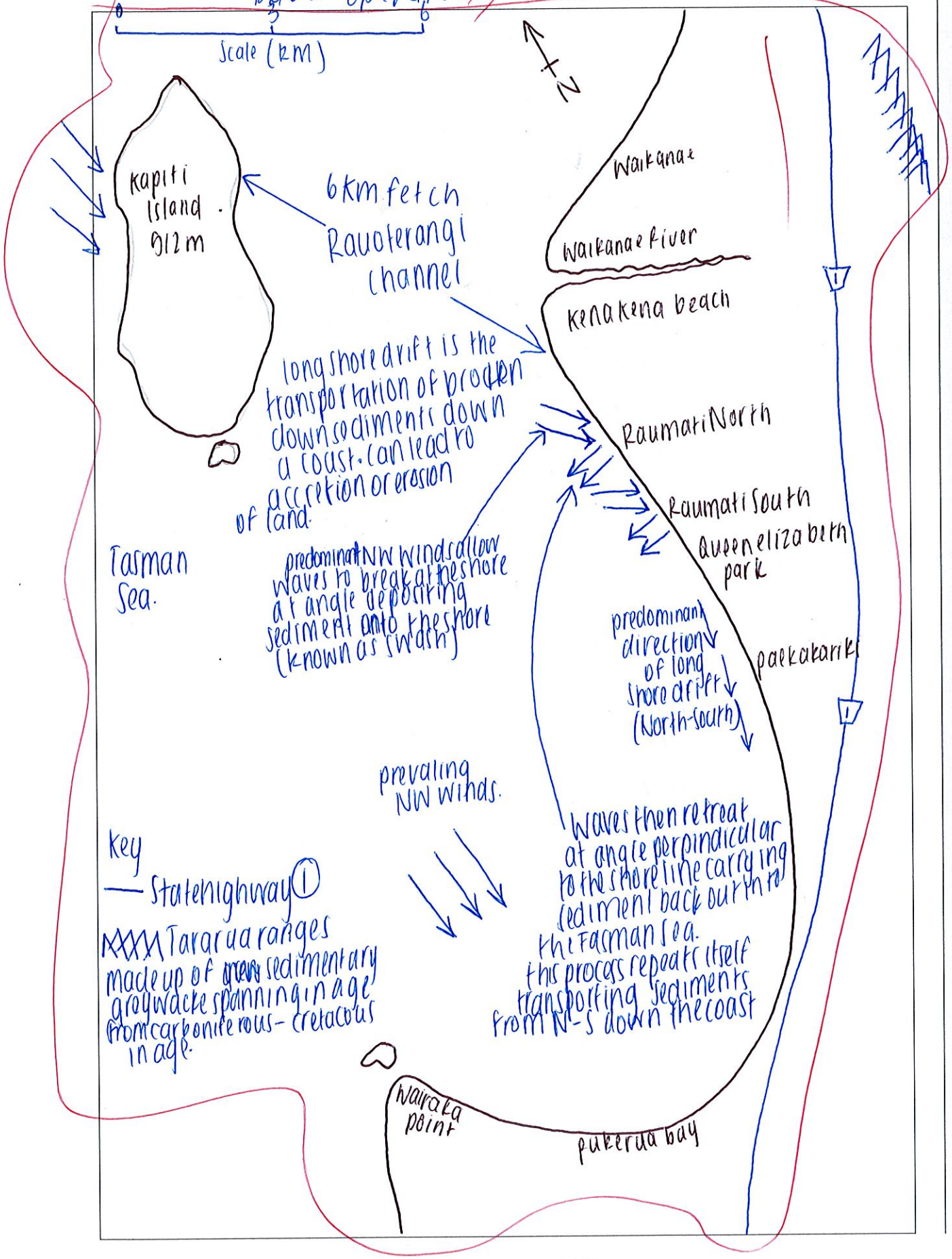
Natural process: Map of Kapiti coast showing how longshore drift operates.



(b) Comprehensively analyse how the process you have drawn and explained in part (a), interacts with at least one other natural process, to shape a feature(s) in your chosen New Zealand geographic environment.

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In your written answer:

- integrate comprehensive, supporting case study evidence about your chosen New Zealand geographic environment and the interacting natural processes that shape it
- refer to the map(s) and/or diagram(s) you have drawn on page 4, and/or integrate other relevant, detailed map(s) and/or diagram(s) as appropriate.

the kapiti coast is located on the lower Western side of the North Island with GPS coordinates of 41°S & 75°E, & is approximately 70km North of Wellington. the studied coast stretches for 40km and is a part of a high wave energy environment. the kapiti coast interacts with many different natural processes to form features which shape the coastline. Onoan the formation of a cuspate is the result of accretion of the land from interacting processes of ~~erosio~~ formation & erosion of sediment, transportation of the sediment, longshore drift, natural breakwaters & saltation which have formed the cuspate seen at kena kena beach on the kapiti coast. the first process is the formation & erosion of sediments. this comes from mesozoic & sedimentary greywacke from The tararua ranges. this rock sparks in age from the carboniferous to cretaceous time period (300-70mya) this was formed through tectonic processes causing the uplift of the land. these rocks ~~are~~ then erode through fluvial & ~~aeol~~ aeolian processes such as abrasion & corrosion. Abrasion is when one type of sediment comes in contact with other sediment & forcefully rubs against it causing bits of sediment to break off.

* this is known as swash.

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Corrosion is when a type of rock comes into contact with fluvial processes such as running water or rain & causes it to dissolve into smaller sediments. this eroded sediment is then transported down the Waikanae River & the Wharemaku Stream, & even quaternary sedimentary rock down the Whanganui River & volcanic basalts from Taranaki. these sediments are transported through gravitational & tidal processes pulling them out to the Tasman sea & towards the Kapiti Coast. the process of longshore drift (as seen in map on page 4) then takes place by transporting sediment down the coast to the Kapiti Coast. the prevailing North westerly winds allow for waves to arrive at ~~the shore~~ an angle to the shore, depositing sediment onto the beach, * the waves then retreat pulling the sediment back into the Tasman sea (known as back-wash). this process repeats itself carrying sediment from North to South down towards the Kapiti Coast.

however on the Kapiti Coast, the waves are more constructive ~~this means~~ than destructive. this means that ~~waves have~~ Swash is able to deposit sediments onto Kena Kena beach but there is not enough wave energy for the backwash to pull sediments back into the Tasman sea, causing the build up/accretion of the land. this is due to the 512m in height Kapiti Island which acts as a natural break water for the eastern side of the island, otherwise known as the 6km wide Kaukoterangi channel. this provides a low wave energy environment with small, calm waves arriving at Kena Kena beach. However this means that the western side of Kapiti Island bears the //

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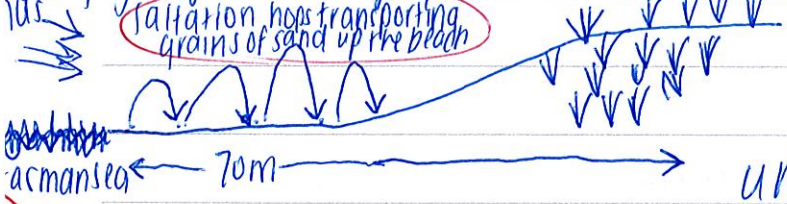
full brunt of the waves from the Tasman sea which can be up to 30 tonnes of water hitting the concentrated area per square metre. this has resulted in the west side of Kapiti Island being a steep, rocky cliff face. The final process which assists in the formation of a cuspate is the process of saltation. saltation occurs through wind action. Westerly winds from the Tasman sea ~~allow~~ are able to pick up the grains of sand & transport it up the 70m wide kena kena beach in short bursts commonly known as "saltation hops". this is when grains of sand get picked up & travel before hitting the ground & then repeating itself. this process repeats itself until the grains get trapped into native vegetation such as spinafex, marram & pingao where they longer are able to move. over time this causes the build up of sand & sand dunes. at kena kena beach there is an active dune system due to the constant constructive waves building the land up.



these 6 processes interact together to form the cuspate seen at kena kena beach. Factors such as ~~their~~ season affect the rate at which this accretion occurs & the size & slope of the beach. Summer brings anti cyclones & calm winds averaging at less than 20kmph. this along with Westerly winds aid the process of saltation & formation of dune systems & also the accretion/build up of the beach leading to the beach profile at kena kena beach become steeper (6-10° of slope angle). Summer also means a drier beach, swash that carries sediment can "soak"

into the dry beach & reduce the gravitational pull coming from the backwash thus resulting in the increased build up of the beach. Winter brings storm systems, low air pressure otherwise known as cyclones and gusty winds ~~averag~~ with speeds average 25+ kmph. this combination of weather can result in high energy waves & 2m+ swells causing destructive waves & ultimately decreasing size of the beach at kena kena beach as backwash can carry sediment with it. the beach is also generally "wet" so sediments are unable to soak into the beach resulting in a greater gravitational pull causing a smaller beach with a less steep beach profile (2-4° of slope angle). these features & factors have interacted together to form the cuspate at kena kena beach, ~~this~~ in the last year it has increased by 2cm & in the last 100 years has grown by 200cm. these processes will continue to interact until the cuspate eventually reaches the offshore kapiti island.

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M6

Extra space if required.
Write the question number(s) if applicable.

QUESTION NUMBER

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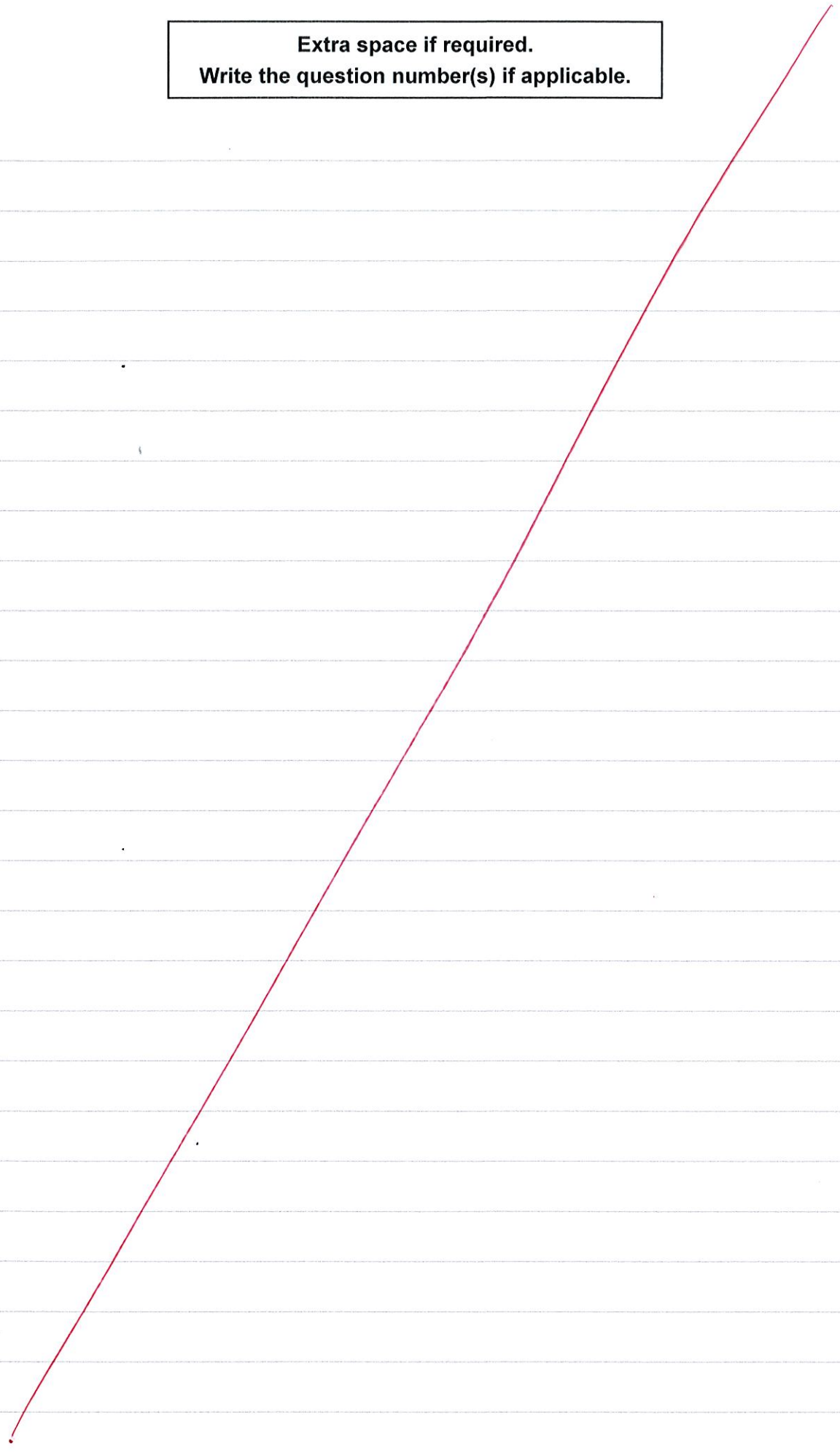

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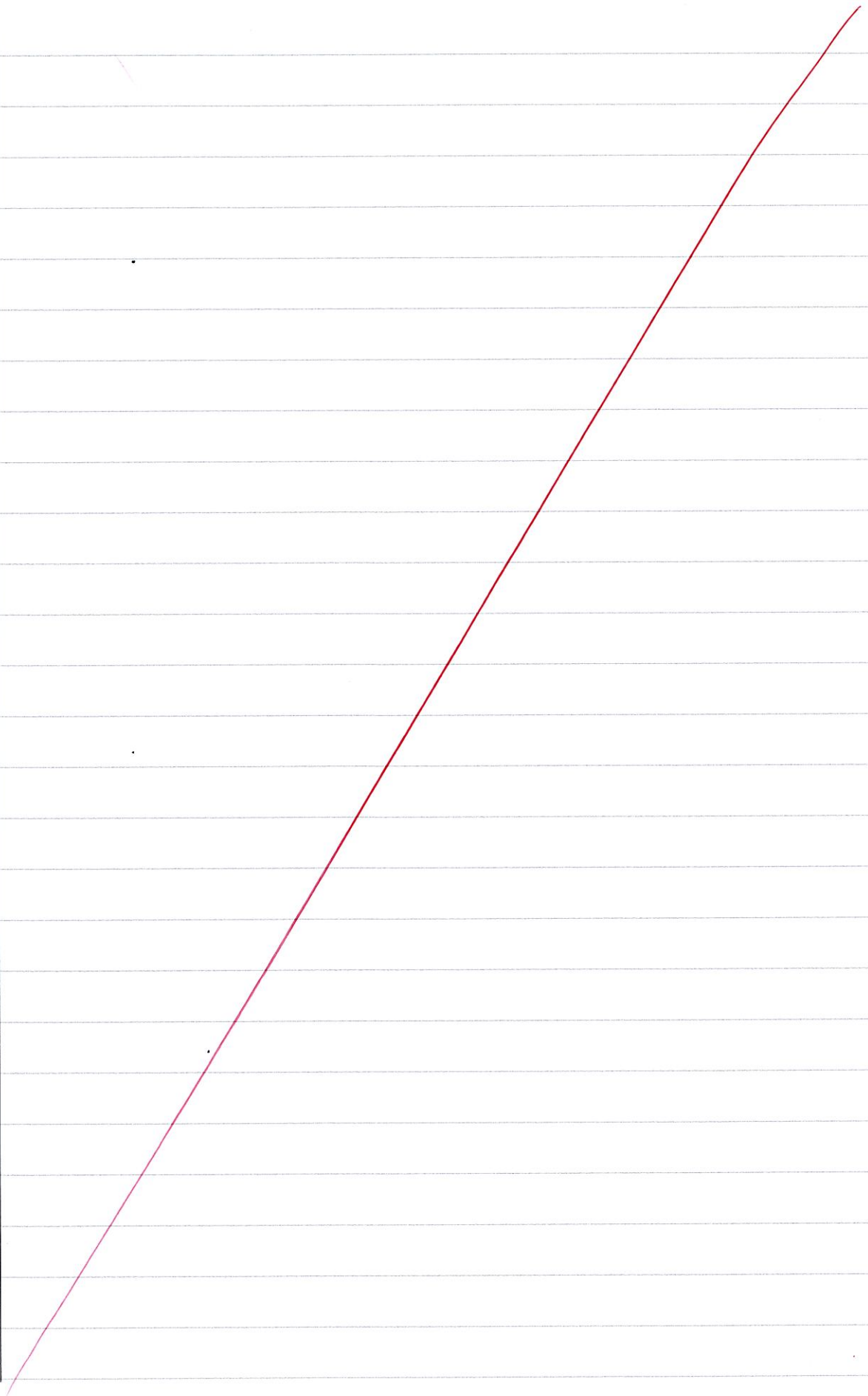

Subject:	Geography	Standard:	91426	Total score:	M6

Q	Grade score	Annotation
Interaction of processes to shape a feature(s)	M6	**Setting: Kapiti Coastal Environment (KCE)** The diagram on page 4 shows the selected natural environment and the process of longshore drift that occurs within it. Annotations provide specific supporting case study evidence and descriptions of where processes operate at different places in the KCE. Some evidence was used from these annotations to help the candidate's written response demonstrate understanding of interactions with other processes to shape a feature with the environment. A detailed understanding of how processes interact is shown throughout the candidate's response. The candidate includes detailed supporting case study evidence but not comprehensively throughout their response. Their reasoning linked to the operation of different processes and interactions between processes was evident within their answer. However, this answer remained at a Merit level because there was a lack of technical detail and depth (comprehension and insight) in their reasoning and process analysis, which limited this response from gaining a higher grade.