



# basic education

Department:  
Basic Education  
**REPUBLIC OF SOUTH AFRICA**

## NATIONAL SENIOR CERTIFICATE

GRADE 12

GEOGRAPHY P2

NOVEMBER 2012

MEMORANDUM

MARKS: 100

EXAMINATION NUMBER														
CENTRE NUMBER														

MARK SCORED	Q1	Q2	Q3	Q4	TOTAL
MARKER					
SENIOR MARKER					
CHIEF MARKER					
MODERATOR					
TOTAL	20	20	40	20	100

This memorandum consists of 14 pages.

**RESOURCE MATERIAL**

1. An extract from topographical map 2829AC HARRISMITH.
2. Orthophoto map 2829AC 3 HARRISMITH.
3. **NOTE:** The resource material must be collected by the schools for their own use.

**INSTRUCTIONS AND INFORMATION**

1. Write your EXAMINATION NUMBER and CENTRE NUMBER in the spaces on the cover page.
2. Answer ALL the questions in the spaces provided in this question paper.
3. You are supplied with a 1:50 000 topographical map 2829AC of HARRISMITH and an orthophoto map of a part of the mapped area.
4. You must hand the topographical map and the orthophoto map to the invigilator at the end of this examination session.
5. You must use the blank page at the back of this paper for all rough work and calculations. Do NOT detach this page from the question paper.
6. Show ALL calculations and formulae, where applicable. Marks will be allocated for this.
7. You may use a non-programmable calculator.
8. The following English terms and their Afrikaans translations are shown on the topographical map.

**ENGLISH**

Diggings  
Caravan Park  
Sewage Works  
River Mouth  
Golf Course  
Wetland

**AFRIKAANS**

Uitgrawings  
Karavaanpark  
Rioolwerke  
Riviermond  
Gholfbaan  
Vlei

**QUESTION 1: MULTIPLE-CHOICE QUESTIONS**

The questions below are based on the 1:50 000 topographical map 2829AC HARRISMITH, as well as the orthophoto map of a part of the mapped area. Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) in the block next to each question.

1.1 The main agricultural activity around Harrismith is ...

- A crop farming.
- B fruit farming.
- C cattle farming.
- D chicken farming.

1.2 The recreational feature marked 1 on the orthophoto map is a ...

- A park.
- B nature reserve.
- C golf course.
- D plantation.

1.3 On the topographical map, Phomolong (A) in block **A6/7** is an example of a/an ... residential area.

- A high-income
- B low-income
- C middle-income
- D informal

1.4 Which town is approximately 60 km from Harrismith?

- A Van Reenen
- B Warden
- C Witsieshoek
- D Kestell

1.5 The Sterkfontein Dam is to the ... of the town of Harrismith.

- A south-west
- B south-east
- C south
- D west

1.6 The map index to the south of 2829AC is ...

- A 2828DB.
- B 2829CA.
- C 2828BD.
- D 2829CB.

1.7 The river in block **C2** on the topographical map flows in a ... direction.

- A south-easterly
- B north-easterly
- C southerly
- D north-westerly

<b>D</b>
----------

1.8 The land-use zone numbered **1** on the orthophoto map is a ...

- A recreational area.
- B rural-urban fringe.
- C residential area.
- D plantation.

<b>A/B</b>
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1.9 The street pattern of the built-up area in blocks **C1**, **C2** en **D2** on the topographical map is ...

- A planned irregular.
- B a grid.
- C unplanned irregular.
- D radial.

<b>A</b>
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1.10 The feature labelled **E** on the topographical map is (a) ...

- A perennial water.
- B non-perennial water.
- C marsh and vlei.
- D non-perennial river.

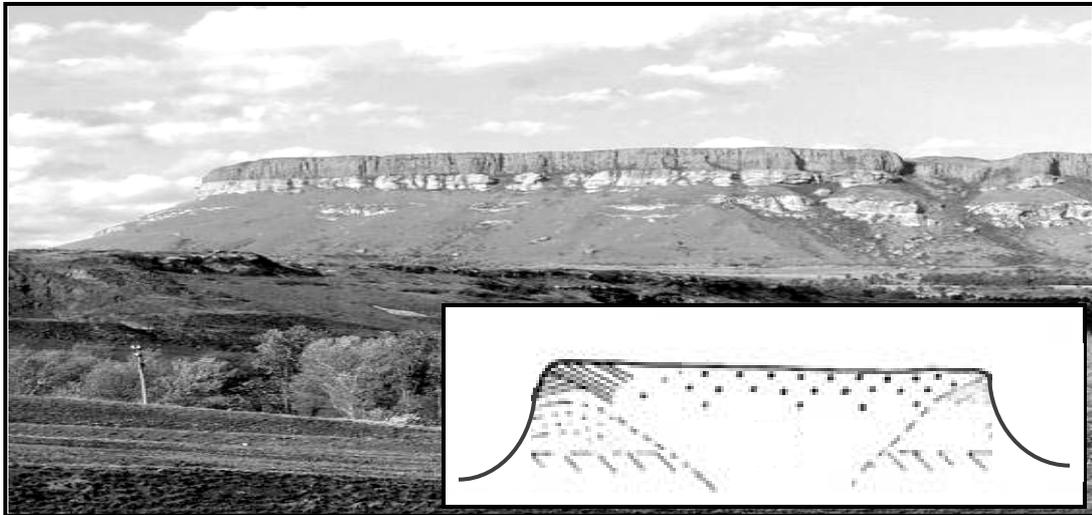
<b>C</b>
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(10 x 2)

**[20]**

**QUESTION 2: CALCULATIONS AND APPLICATION**

2.1 Harrismith holds an annual marathon that involves contestants running via Platberg. Study both the photograph of Platberg below and the area covered by blocks **A/B10**, **11**, **12** and **13** on the topographical map before attempting the questions below.



2.1.1 Identify the landform named Platberg.

*Mesa/flat topped mountain ✓ (1 x 1) (1)*

2.1.2 Identify the shape of the slope that the contestants will be running up between points **C–D** (block **A/B10**) on the topographical map. Explain your answer with reference to the contour lines on the map.

Slope *Concave/ concave at the bottom and convex over the cliff ✓*  
Explanation *At C the contour lines are far apart and closer to D the contour lines are very close to each other ✓ [Concept] (2 x 1) (2)*

2.1.3 Calculate the average gradient of the slope between spot height 1797 and spot height 2263 in block **A10** on the topographical map. Show ALL calculations.

$$\frac{VI}{HE} \checkmark = \frac{2263 - 1797}{3,8 \checkmark \times 500} \qquad \text{Gradient} = \frac{VI}{HE} \checkmark$$

$$= \frac{466 \checkmark}{1900 \checkmark} \qquad \text{OR} \qquad VI = 2263 - 1797$$

$$= 1 : 4.07 \checkmark \qquad = 466 \checkmark$$

$$\qquad \qquad \qquad HE = 3,8 \checkmark \times 500$$

$$\qquad \qquad \qquad = 1900 \checkmark$$

$$\qquad \qquad \qquad \text{Gradient} = \frac{466}{1900}$$

$$\qquad \qquad \qquad = 1 : 4.07 \checkmark$$

**(Range: 3,96 – 4,2) (5 x 1) (5)**

2.1.4 Comment on the level of difficulty of this slope for a contestant.

*Easier at the bottom and **difficult** when one gets to the top ✓*  
[Concept of difficulty] (1 x 1) (1)

2.1.5 Explain why a zig-zag footpath (block **A11**) has been cut over Platberg.

*To reduce the steepness of the slope/avoid obstacles ✓*  
*To make it easier for runners/hikers/walkers to get to the top of the mountain/follows contours to make it less steep/make it safer ✓*  
*To prevent erosion/mass movement ✓*  
[Concept] (1 x 1) (1)

2.2 Using the information on the topographical map, determine the magnetic declination for this year. Show ALL calculations/steps followed.

$$\begin{aligned} \text{Difference in years} &= 2012 - 2001 \\ &= 11 \text{ years } \checkmark \end{aligned}$$

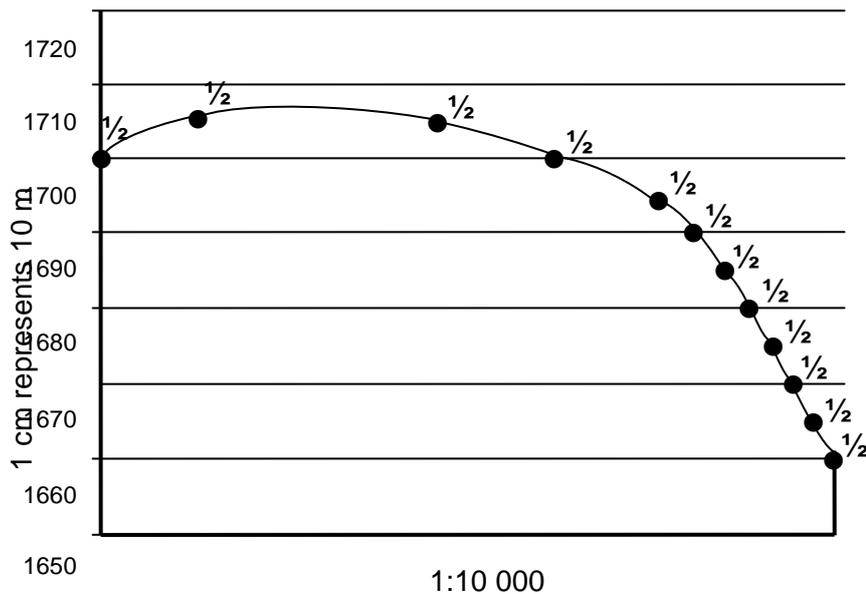
$$\begin{aligned} \text{Mean annual change} &= 11 \times 8' \\ &= 88' / 1^{\circ}28'W \checkmark \end{aligned}$$

$$\begin{aligned} \text{Magnetic declination in 2012} &= 20^{\circ}28'W \\ &+ \checkmark \frac{88'}{1^{\circ}28'W} \\ &= 21^{\circ}56'W \checkmark \end{aligned}$$

(4 x 1) (4)

2.3 Refer to the feature labelled Blokhuis (4) on the orthophoto map.

Draw a cross-section of the feature from 2 to 3 on the axis provided below.

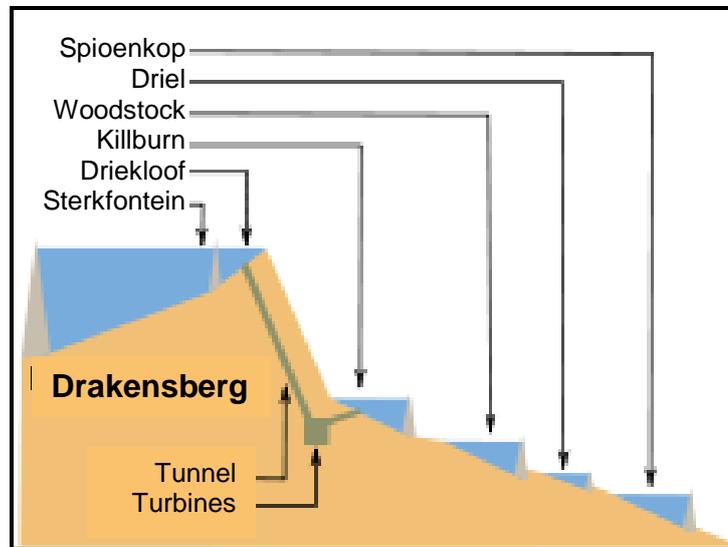


[1/2 for every correct •] 12 x 1/2 (6)

[20]

**QUESTION 3: APPLICATION AND INTERPRETATION**

3.1 The Sterkfontein Dam forms an important part of the Tugela-Vaal Scheme. Refer to the diagram below (**FIGURE 3.1**) as well as the dam on the topographical map to answer the questions that follow.



**FIGURE 3.1**

3.1.1 Describe the difference in position of the Sterkfontein Dam in relation to the Spioenkop, Driel, Woodstock and Killburn Dams.

*Sterkfontein Dam on the plateau and the others on foothills of the Drakensberg ✓✓*

*Sterkfontein is higher and the other dams lower ✓✓*

*Sterkfontein further inland and the others towards the ocean ✓✓*

*Sterkfontein is in the west and the others are towards the east ✓✓*

[Any ONE]

(1 x 2) (2)

3.1.2 The Sterkfontein Dam has an ideal location for the storage of water. Give ONE reason to support this statement.

*In an area with low evaporation rates ✓✓*

*Natural flow of water into the area ✓✓*

*It is deep ✓✓*

*Has a small surface area ✓✓*

*Gravitational flow/hydro-power ✓✓*

*Contained by high area with narrow opening ✓✓*

*Basaltic area therefore forms aquiclude ✓✓*

*Ideal to store water before its pumped to Vaal Dam ✓✓*

[Any ONE]

(1 x 2) (2)

3.1.3 Name TWO ways in which the residents of Harrismith and its surrounding area can benefit from the Sterkfontein Dam.

*Water supply for domestic ✓✓ and industrial use ✓✓ and mining ✓✓*  
*Generation of electricity ✓✓*  
*For irrigation/farming ✓✓*  
*Recreation or examples e.g. fishing/sailing/rowing ✓✓*  
*Tourism ✓✓*  
*Job opportunities ✓✓*  
*Flood control ✓✓*  
 [Any TWO] (2 x 2) (4)

3.2 Harrismith is located in a low-rainfall area. Give TWO pieces of evidence from the map to support this statement.

*There are a number of dams ✓✓*  
*There are a number of non-perennial rivers/dry river courses ✓✓*  
*Many wind pumps to use underground water ✓✓*  
*Many reservoirs to store water ✓✓*  
*Furrows for irrigation ✓✓*  
*Many firebreaks to prevent runaway fires ✓✓*  
**(Allocate marks for a well presented logical answer that this is a high rainfall area and give reasons from the map)**  
 [Any TWO] (2 x 2) (4)

3.3 Identify the drainage pattern in blocks **E/F3, 4** and **5** and give evidence from the map to support your answer.

*Radial/centrifugal ✓✓*  
*Rivers flow from the mountain outwards ✓✓*  
 [Concept] (2 x 2) (4)

3.4 Refer to Nuwejaarspruit in block **G2** on the topographical map.

3.4.1 Is this a perennial or non-perennial river?

*Perennial ✓✓* (1 x 2) (2)

3.4.2 Nuwejaarspruit is in its middle course, changing to the lower course. Give TWO pieces of evidence from the map to support this statement.

*A lot of meanders ✓✓*  
*Oxbow lake has developed ✓✓*  
*Abandoned meanders ✓✓*  
*Meander scar ✓✓*  
*Wide floodplain ✓✓*  
*Gradual course ✓✓*  
*Marshes and vleis ✓✓*  
 [Any TWO] (2 x 2) (4)

- 3.5 Harrismith is a very old town that developed in the colonial era. Support this statement with ONE piece of evidence from the map.

*Monuments/ The Block house ✓✓*

*It tells (assumed) of the Anglo Boer War/South African War ✓✓*

*42<sup>nd</sup> Black Watch of South Staffordshire Regiment ✓✓*

*Royal Highlanders ✓✓*

*42<sup>nd</sup> Black Watch of Manchester Regiment ✓✓*

*42<sup>nd</sup> Black Watch of Royal Highlanders Regiment ✓✓*

*Special font used to indicate the features ✓✓*

*The whole town has gridiron street pattern ✓✓*

*(English/British) place names have a colonial feel e.g. Victoria lake/Queens Hill etc ✓✓*

[Any ONE]

(1 x 2) (2)

- 3.6 Refer to the dominant primary activity practiced in blocks **H1** and **H2**.

- 3.6.1 Identify the dominant primary activity referred to above.

*Mining/Open cast mining/excavation ✓✓*

(1 x 2) (2)

- 3.6.2 Explain how the environment is likely to be affected by this activity identified in QUESTION 3.6.1 in a negative way.

*Unhealthy environment/ environmental injustice ✓✓*

*Cause land/air and water pollution/ground water pollution ✓✓*

*Destruction of natural vegetation ✓✓*

*Destroys ecosystem/biodiversity/habitat ✓✓*

*Soil erosion ✓✓*

*Destroy aesthetic appeal/scars the land*

*Despoliation ✓✓*

*Mass movement/examples of ✓✓*

[Any ONE]

(1 x 2) (2)

- 3.7 Refer to the N3.

- 3.7.1 Why does the N3 NOT pass through Harrismith?

*Need to reach destination sooner ✓✓*

*To avoid traffic congestion in town ✓✓*

*Reduce accident rate/safer route ✓✓*

*Reduce noise and air pollution ✓✓*

*Build around an already established settlement ✓✓*

*CBD couldn't handle a large volume of traffic ✓✓*

*Damage to roads by increase traffic flow ✓✓*

[Any TWO]

(2 x 2) (4)

3.7.2 What is the disadvantage for businesses of the N3 not passing through Harrismith?

*Potential income by tourists will decrease ✓✓*  
*Decrease of threshold population ✓✓*  
*Economic stagnation/small business close down ✓✓*  
 [Concept]  
 [Any ONE]

(1 x 2) (2)

3.8 Refer to Wilgerpark on the orthophoto map.

3.8.1 Wilgerpark developed much later than the original town of Harrismith. Give ONE reason from the orthophoto map to support this statement.

*Wilgerpark has a planned irregular street pattern ✓✓*  
*Less vegetation/trees/plants ✓✓*  
*Situated on the outskirts/far from existing built-up area/CBD ✓✓*  
*Fewer/No services ✓✓*  
*Open spaces between buildings ✓✓*  
 [Any ONE]

(1 x 2) (2)

3.8.2 Wilgerpark is a high-income residential area. Give ONE piece of evidence from the topographical map to support your answer.

*Large stands/houses ✓✓*  
*Far from the industries/CBD ✓✓*  
*Close to open space/river ✓✓*  
*Close to recreational areas ✓✓*  
*Build on North facing/warm slopes ✓✓*  
*Accessibility ✓✓*  
 [Any ONE]

(1 x 2) (2)

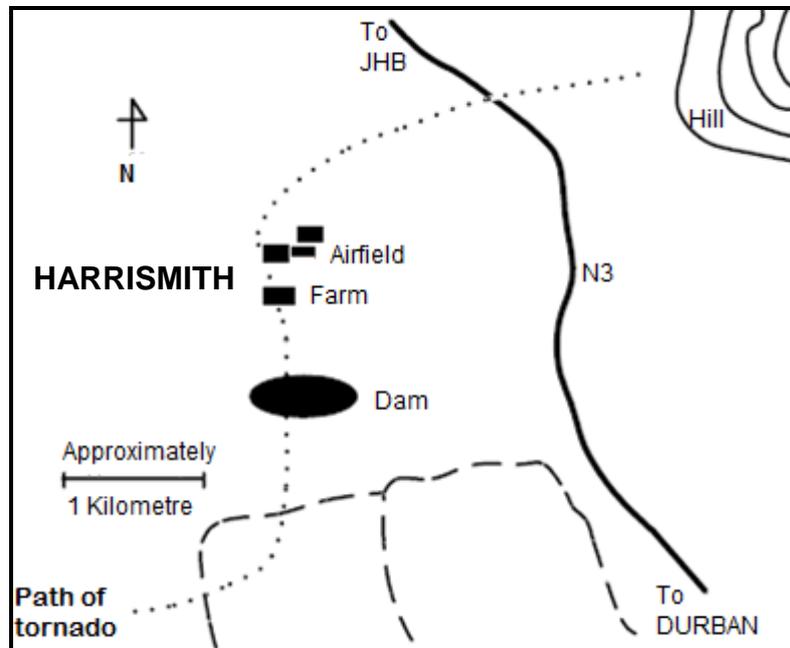
3.8.3 Give ONE disadvantage of the location of Wilgerpark.

*Close to the N5 causing noise ✓✓*  
*Far from the CBD/services ✓✓*  
*Longer distance to travel to work/higher transport costs ✓✓*  
*Unhealthy to live next/below the power line which runs through the settlement ✓✓*  
*Prevailing winds from industries and sewage plants cause pollution/bad odours ✓✓*  
 [Any ONE]

(1 x 2) (2)  
**[40]**

**QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEMS (GIS)**

4.1 Study the map below (**FIGURE 4.1**) which shows the path of the tornado that tore through Harrismith a few years ago. Many data layers were used to draw this map.



[Source: Goliger en Van Wyk]

**FIGURE 4.1**

4.1.1 Define the term *data layering (overlying)*.

*Combination of different data layers to produce a map for a particular area ✓✓*

[Concept]

(1 x 2) (2)

4.1.2 Name TWO data layers visible on the map (**FIGURE 4.1**).

*Road/airfield/transport/infrastructure ✓✓*

*Relief/contours/hill/topography ✓✓*

*Dam/drainage ✓✓*

*Farming/cultivation ✓✓*

*Buildings ✓✓*

*Path of tornado ✓✓*

[Any TWO]

(2 x 2) (4)

4.1.3 GIS is useful in disaster management. Explain how it would have assisted the local authorities with planning after the tornado struck.

*Check service delivery shortfalls after a tornado ✓✓*

*Route planning to supply relief ✓✓*

*Analyse the quality of service ✓✓*

*Relief coordination ✓✓*

*Prioritizing relief ✓✓*

*Satellite pictures to assess the destruction ✓✓*

[Any TWO. Accept other]

(2 x 2)

(4)

4.2 Study the photo (**FIGURE 4.2**) of the N3 that bypasses Harrismith and connects Durban and Johannesburg.



[Source: Google]

**FIGURE 4.2**

4.2.1 Differentiate between *spatial data* and *attribute data*.

*Spatial data describes the location of features using coordinates/position of features ✓✓*

[Concept]

*Attribute data is the value given to the spatial data/characteristics about feature/description of feature ✓✓*

[Concept]

(2 x 2)

(4)

4.2.2 What type of spatial object (point, line or polygon) is the road?

*Line ✓✓*

(1 x 2)

(2)

4.2.3 Give ONE attribute that can be captured for the N3.

*National road* ✓✓

*Tarred road* ✓✓

*Many lanes* ✓✓

*Road markings* ✓✓

*Bench marks* ✓✓

*Road signs* ✓✓

*Speed cameras* ✓✓

[Any ONE. Accept other suitable answers]

(1 x 2)

(2)

4.3 If a vehicle with a global positioning system (GPS) approaches Harrismith, how can the GPS assist the driver to find the hospital numbered **10** on the orthophoto map?

*It provides the precise position and direction to the driver* ✓✓

*Through navigation* ✓✓

[Any ONE]

(1 x 2)

(2)

**[20]**

**GRAND TOTAL:**

**100**