



# basic education

Department:  
Basic Education  
REPUBLIC OF SOUTH AFRICA

## NATIONAL SENIOR CERTIFICATE

GRADE 12

GEOGRAPHY P2

NOVEMBER 2013

MEMORANDUM

MARKS: MARK OUT OF 96 AND CONVERT TO 100.

EXAMINATION NUMBER																				
CENTRE NUMBER																				

MARK SCORED	Q1	Q2	Q3	Q4	TOTAL
MARKER					
SENIOR MARKER					
CHIEF MARKER					
MODERATOR					
TOTAL	20	20	36	20	96

This memorandum consists of 12 pages.

**RESOURCE MATERIAL**

1. An extract from topographical map 2930CA MERRIVALE.
2. Orthophoto map 2930CA5 MERRIVALE.
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 2930CA of MERRIVALE 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  
Golf course  
Wetland

**AFRIKAANS**

Uitgrawings  
Karavaanpark  
Rioolwerke  
Gholfbaan  
Vlei

**QUESTION 1: MULTIPLE-CHOICE QUESTIONS**

The questions below are based on the 1 : 50 000 topographical map 2930CA MERRIVALE, 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 map reference of the topographical map east of Merrivale is ...

- A 2930AC.
- B 2930AD.
- C 2930CD.
- D 2930CB.

**D**

1.2 The height of the Mount Ashley Farms Dam wall in block **C4** is ... metres.

- A 1 080
- B 1 100
- C 1 120
- D 1 140

**A/B**

1.3 The Mgeni (**A4**) is a/an ... river.

- A permanent
- B periodic
- C episodic
- D exotic

**A**

1.4 The order of stream **A** as it leaves block **A1** is ...

- A 2<sup>nd</sup> order.
- B 3<sup>rd</sup> order.
- C 4<sup>th</sup> order.
- D 5<sup>th</sup> order.

**B**

1.5 Slope **1–2** on the orthophoto map is ...

- A steep.
- B concave.
- C convex.
- D gentle.

**C**

1.6 The man-made feature **3** on the orthophoto map is ...

- A an excavation.
- B a reservoir.
- C a dam.
- D sewage works.

**C**

1.7 Route 103 to Howick West in block **A11** is a/an ...

- A national road.
- B main road.
- C secondary road.
- D other road.

**B**

1.8 Area **5** on the orthophoto map is a/an ...

- A sports facility.
- B industry.
- C station.
- D school.

**D**

1.9 The main way of transporting water to the agricultural land in block **C11** on the topographical map is by means of ...

- A wind pumps.
- B pipelines.
- C canals.
- D furrows.

**D**

1.10 The position of the reservoir in block **D9** on the topographical map is ...

- A 30°11,6' S 29°33,5'E OR 30°11'36" S 29°33'30"E
- B 30°11,6' E 29°33,5'S OR 30°11'36" E 29°33'30"S
- C 29°33,6' S 30°11,6'E OR 29°33'35" S 30°11'36"E
- D 29°33,6' E 30°11,6'S OR 29°33'35" E 30°11'36"S

**C**

(10 x 2)

**[20]**

## QUESTION 2: MAP CALCULATIONS AND INTERPRETATION

2.1 Refer to the topographical map and calculate the area of the space labelled *photographed area* in km<sup>2</sup>.

### ON TOPOGRAPHIC MAP

**Measurement range:** *length* - 9,5 cm to 9,9 cm OR 95 mm to 99 mm  
*breadth* - 6,1 cm to 6,5 cm OR 61 mm to 65 mm

$$\begin{aligned} \text{Area} &= \text{length} \times \text{breadth} \text{ (height} \times \text{base)} \checkmark \\ &= (9,7 \text{ cm} \times 0,5) \text{ km} \checkmark \times (6,3 \text{ cm} \times 0,5) \text{ km} \checkmark \\ &= 4,85 \text{ km} \times 3,15 \text{ km} \checkmark \\ &= 15,59 \text{ km}^2 \checkmark \end{aligned}$$

**OR**

$$\begin{aligned} \text{Area} &= \text{length} \times \text{breadth} \checkmark \\ &= \frac{(97 \text{ mm} \times 50\,000)}{1\,000\,000} \text{ km} \checkmark \times \frac{(63 \text{ mm} \times 50\,000)}{1\,000\,000} \text{ km} \checkmark \\ &= 4,85 \text{ km} \times 3,15 \text{ km} \checkmark \\ &= 15,27 \text{ km}^2 \checkmark \end{aligned}$$

**[Range is 14,49 km<sup>2</sup> to 16,08 km<sup>2</sup>]**

(5)

**ON ORTHOPHOTO**

**Measurement range: length: 42,5 cm to 42,9 cm OR 425 mm to 429 mm  
breadth: 32,1 cm to 32,5 cm OR 321 mm to 325 mm**

$$\begin{aligned} \text{Area} &= \text{length} \times \text{breadth (height} \times \text{base)} \checkmark \\ &= (42,7 \text{ cm} \times 0,1) \text{ km} \checkmark \times (32,3 \text{ cm} \times 0,1) \text{ km} \checkmark \\ &= 4,27 \text{ km} \times 3,23 \text{ km} \checkmark \\ &= 13,79 \text{ km}^2 \checkmark \end{aligned}$$

**OR**

$$\begin{aligned} \text{Area} &= \text{length} \times \text{breadth} \checkmark \\ &= \frac{(427 \text{ mm} \times 10\,000) \text{ km} \checkmark}{1\,000\,000} \times \frac{(323 \text{ mm} \times 10\,000) \text{ km} \checkmark}{1\,000\,000} \\ &= 4,27 \text{ km} \times 3,23 \text{ km} \checkmark \\ &= 13,77 \text{ km}^2 \checkmark \end{aligned}$$

**[Range is 13,94 km<sup>2</sup> to 13,64 km<sup>2</sup>]**

(5)

2.2 Refer to the reservoir in block **D9** and trigonometrical station 156 in block **E10** on the topographical map to answer the following questions.

2.2.1 Give the true bearing of the reservoir from trigonometrical station 156.

$$\begin{aligned} &311^\circ \checkmark \\ &[\text{Range: } 309^\circ \text{ to } 313^\circ] \end{aligned}$$

(1)

2.2.2 Calculate the magnetic bearing of the reservoir from trigonometrical station 156 for the year 2013.

$$\begin{aligned} \text{Difference in years} &= 2013 - 2002 \\ &= 11 \text{ years} \checkmark \end{aligned}$$

$$\begin{aligned} \text{Total annual change} &= 11 \times 12' \text{ W} \\ &= 132' \text{ W} / 2^\circ 12' \text{ W} \checkmark \end{aligned}$$

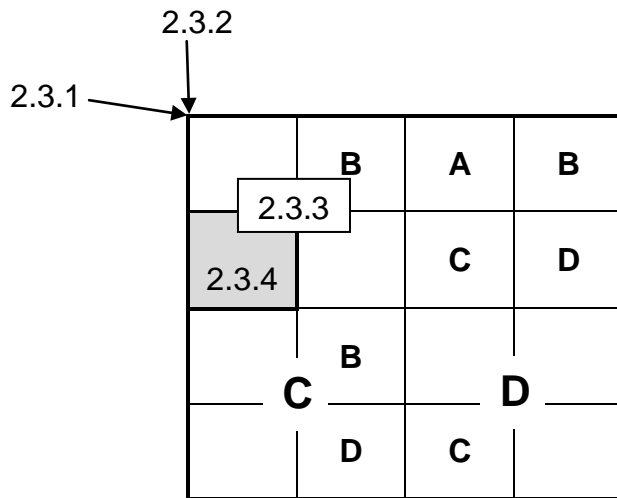
$$\begin{aligned} \text{Magnetic declination} &= 22^\circ 42' \text{ W} + \checkmark 132' \text{ W} / 2^\circ 12' \text{ W} \\ &= 24^\circ 54' \text{ W} \checkmark \end{aligned}$$

$$\begin{aligned} \text{Magnetic bearing} &= 311^\circ (309^\circ \text{ to } 313^\circ) + 24^\circ 54' \text{ W} / \text{formula} \checkmark \\ &= 335^\circ 54' \text{ W} \checkmark \end{aligned}$$

**[Range : 333°54'W to 337°54'W]**

(6)

2.3 Use the grid below to explain the index number 2930AC MERRIVALE of the topographical map.



Identify each of the following in the grid above:

2.3.1 The line of latitude: 29 ✓

2.3.2 The line of longitude: 30 ✓

2.3.3 The big block letter: A ✓

2.3.4 The small block letter: C ✓

(4)

2.4 In which general direction would one be travelling to go from Merrivale to Pietermaritzburg?

*South east*

(1)

2.5 Refer to the rifle range in block **D10**.

2.5.1 Use the line scale to determine the approximate length of the rifle range in metres.

*850 m to 900 m ✓✓*

(2)

2.5.2 State the approximate difference in height between the southern and northern edge of the rifle range.

*20 m ✓*

**[Range: 18 to 22]**

(1)

**[20]**

**QUESTION 3: APPLICATION AND INTERPRETATION**

- 3.1 What evidence supports the statement that Merrivale receives seasonal rainfall?

*There are a lot of dams/perennial waters on the map* ✓✓  
*There are a lot of non-perennial/periodic/episodic rivers* ✓✓  
*Furrows for irrigation/cultivated lands close to dams and rivers* ✓✓  
*Reservoirs* ✓✓  
*Windmills and windpumps* ✓✓  
 [Any TWO]

2x2 (4)

- 3.2 There is evidence of crop farming to the south of Merrivale on the topographical map. State TWO factors that favoured the development of this type of farming.

*Good infrastructure (examples of)* ✓✓  
*Availability of water/irrigation (examples of)* ✓✓  
*Gentle slopes* ✓✓  
*Fertile/arable land* ✓✓  
*Availability of open farm land* ✓✓  
*Close to a market* ✓✓  
*Availability of labour* ✓✓  
*Situated on the north-facing side of the mountain/sunny side* ✓✓  
 [Any TWO]

2x2(4)

- 3.3 The area on the topographical map is mainly covered by woodlands/plantations.

- 3.3.1 With reference to the topographical map, state ONE way in which these woodlands/plantations are protected against bush fires.

*There are lookout towers* ✓✓  
*Presence of firebreaks* ✓✓  
*The roads in the plantation prevent the spread of fires* ✓✓  
*Small dams/furrows/rivers in the forested areas*  
 [ANY ONE] ✓✓

1x2 (2)

- 3.3.2 Give ONE point of evidence from the map that these woodlands/plantations are grown for commercial purposes.

*Many roads to transport wood* ✓✓  
*Provision of housing for labourers* ✓✓  
*Protective measures (examples) in place* ✓✓  
*Large area covered* ✓✓  
*Millpark/sawmill* ✓✓  
*Naming of plantations* ✓✓  
 [ANY ONE]

1x2 (2)

3.4 Refer to the Mgeni River in block **B1/2**.

3.4.1 Name the TWO fluvial features **C** and **D** along the Mgeni River channel in block **B1/2**.

*C Flood plain/alluvial plain √√*  
*D Meander/undercut slope √√*

2x2 (4)

3.4.2 Give ONE reason why feature **C** is useful to farmers.

*Fertile soil/silt deposited from river √√*  
*Flat land/gentle gradient √√*  
*Close to river for water/irrigation √√*  
*[ANY ONE]*

1x2 (2)

3.5 Refer to the drainage pattern in block **A1**.

3.5.1 Identify the drainage pattern in block **A1**.

*Dendritic √√*

1x2 (2)

3.5.2 Give ONE reason for your answer to QUESTION 3.5.1.

*It has a shape of a branches of a tree √√*  
*Tributaries join the main river at acute (small) angles √√*  
*[ANY ONE]*

1x2 (2)

3.5.3 State the rock type that is likely to be found underlying the drainage pattern in QUESTION 3.5.1.

*Igneous/horizontal sedimentary/metamorphic/uniform resistant √√*

1x2 (2)

3.6 Refer to the picture below of a typical settlement likely to be found at Shaywhen in block **D6**.





- 3.6.1 Is Shaywhen a rural or an urban settlement?  
*Rural* ✓✓ 1x2 (2)
- 3.6.2 Give ONE reason for your answer to QUESTION 3.6.1.  
*Agriculture/farming/unifunctional is the main activity* ✓✓  
*No urban functions/services shown* ✓✓  
*Isolated/buildings far apart* ✓✓  
[ANY ONE] 1x2 (2)
- 3.7 Refer to land-use zone **10** on the orthophoto map.
- 3.7.1 Identify land-use zone **10**.  
*Industrial zone/area/park/factories/manufacturing* ✓✓  
*Recreational zone* ✓✓  
*Rural-urban fringe* ✓✓  
[ANY ONE] 1x2 (2)
- 3.7.2 Describe TWO factors that have influenced the location of this land-use zone.  
**For industries**  
*Open space/expansion* ✓✓  
*Closer to bulk transport routes* ✓✓  
*Access to the market* ✓✓  
*Located on flat land* ✓✓  
*Away from built-up areas* ✓✓  
*Close to labour* ✓✓  
*Access to cheaper land* ✓✓  
[ANY TWO]  
**For recreation**  
*Open space/expansion* ✓✓  
*Close to transport routes* ✓✓  
*Located on flat land* ✓✓  
*Away from built-up areas* ✓✓  
*Access to cheaper land* ✓✓  
[ANY TWO]  
**For rural-urban fringe**  
*On outskirts of settlement* ✓✓  
*Close to roads/accessibility* ✓✓  
*Located on flat land* ✓✓  
*Away from built-up areas* ✓✓  
*Open space/expansion* ✓✓  
*Access to cheaper land* ✓✓  
[ANY TWO] 2x2 (4)

- 3.7.3 State ONE problem that the residents of the settlement next to **10** are likely to experience.

*Air pollution* ✓✓  
*Noise* ✓✓  
*Odours/bad smells* ✓✓  
*Constant passing by of large trucks* ✓✓  
*Respiratory problems* ✓✓  
*Acid rain* ✓✓  
*Traffic congestion* ✓✓  
*Litter* ✓✓

[ANY ONE. Accept other. Answer based on choice in Q3.7.1]

1x2 (2)

- 3.8 Find Mbubu in block **F10**. From a climatic point of view, Mbubu is situated incorrectly. Explain this statement.

**IGNORE THIS QUESTION. MARK OUT OF 96 AND CONVERT TO 100.**

[36]

**QUESTION 4: GEOGRAPHIC INFORMATION SYTEMS (GIS)**

- 4.1 With reference to spatial objects on the Merrivale topographical map, answer the following questions.

- 4.1.1 Below is a picture of a line object found in block **B10**. Name the line object.



*Windbreak/Line of trees/row of trees/other road* ✓✓

1x2 (2)

- 4.1.2 Identify ONE point feature in block **D9**.

*Spot height* ✓✓  
*Reservoir* ✓✓  
*Houses/building structures* ✓✓  
 [ANY ONE]

1x2 (2)

- 4.2 Refer to the picture of the Midmar Dam below and answer the questions that follow.



- 4.2.1 What type of spatial object is the Midmar Dam?  
*Polygon/area* ✓✓ 1x2 (2)
- 4.2.2 Is the picture a raster or vector image?  
*Raster* ✓✓ 1x2 (2)
- 4.2.3 GIS can be used to predict the amount of silt and fertiliser entering the dam by integrating different sources of information. What is the term used to describe this process?  
*Data integration/data layering/thematic layers* ✓✓ 1x2 (2)
- 4.2.4 Explain why the clarity of the picture of the Midmar Dam is poor.  
*Camera did not have a good resolution* ✓✓  
*Fewer pixels per photograph* ✓✓  
[ANY ONE] 1x2 (2)
- 4.2.5 What is the term used to describe the process whereby all the data about the Midmar dam stored on the computer is analysed?  
*Data analysis/data manipulation/data processing* ✓✓ 1x2 (2)

4.5 Answer the following questions on data layering:

4.5.1 What does the term *data layering* mean?

*Maps showing different types of information are projected onto one another/placed on top of one another √√*  
[Concept]

1x2 (2)

4.5.2 State TWO uses of data layering in a GIS.

*Different sets of data can be compared √√*  
*Relationships between different sets of data can be established √√*  
*Analysing different sets of information √√*  
*Comparisons can assist with future developments √√*  
[ANY TWO. Accept other reasonable answers]

2x2 (4)

**[20]**

**TOTAL: 100**