



**LIMPOPO**

**PROVINCIAL GOVERNMENT**  
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF  
**EDUCATION**

**WATERBERG DISTRICT**

**GRADE 11**

**GEOGRAPHY**

**MAPWORK TASK**

**25 MAY 2022**

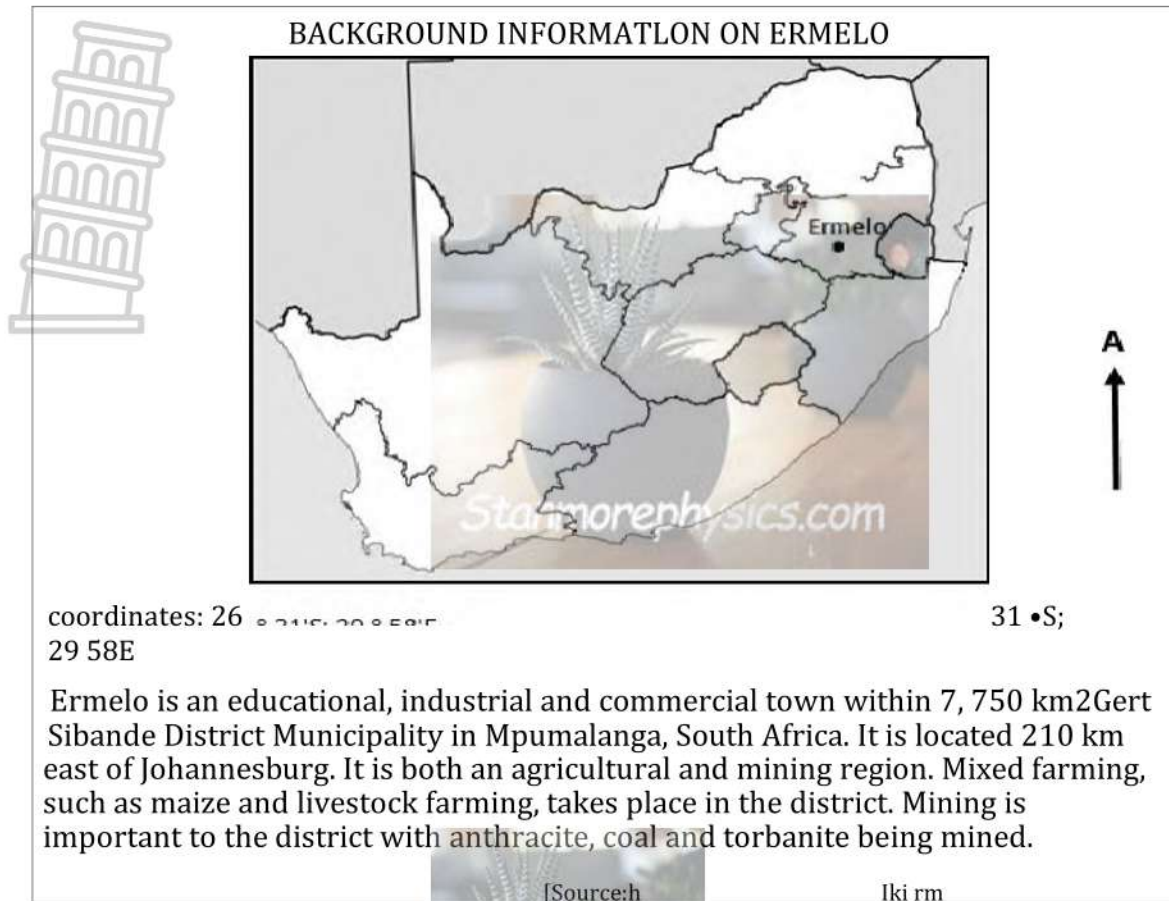
**ERMELO**

**MARKS: 60**

**INTRRCTIONS:**

**This memo consist of 8 pages.**

BACKGROUND INFORMATION ON ERMELO



coordinates: 26° 29' 58" S; 31° 58' 29" E

Ermelo is an educational, industrial and commercial town within 7,750 km<sup>2</sup> Gert Sibande District Municipality in Mpumalanga, South Africa. It is located 210 km east of Johannesburg. It is both an agricultural and mining region. Mixed farming, such as maize and livestock farming, takes place in the district. Mining is important to the district with anthracite, coal and torbanite being mined.

[Source: h...]

The following English terms and their Afrikaans translations are shown on the topographical map:

ENGLISH

Diggings

Sewerage works

Open cast mine

Prison

purification plant

AFRICAN

Excavations

River

Sewage works

Open pit mine

Prison

purification  
plant



**QUESTION 1: MULTIPLE CHOICE QUESTION**

The following questions are based on 1: 50 000 topographical map \*\*\*\*\*. The orthophoto map may be used. Choose the correct answer and write the letter in the square box.

1.1.1. Ermelo is situated in the ..... (1x1)1

- A. Eastern Cape
- B. Northern Cape
- C. Mpumalanga
- D. Free State

1.1.2. 29 in the map index 2629DB refers to ..... (1x1)1

- A. Longitude
- B. Latitude
- C. Gratitude
- D. Code

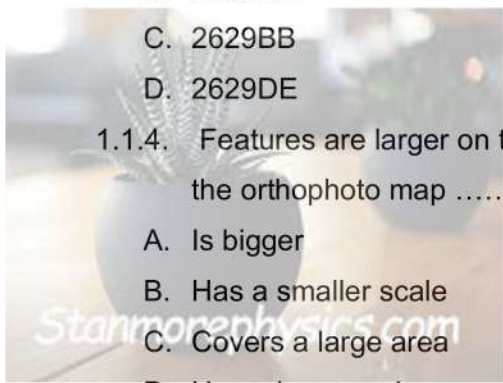
1.1.3. What is the map index South – West of 2629DB? ..... (1x1)1

	45°	30°	15°	30°
15°	2629DF	2629DA	2629DC	
45°				
24°	2629DG	ERMELO 2629DB	2629DD	
15°	2629BB	2629DA	2629DE	

- A. 2629DF
- B. 2629DA
- C. 2629BB
- D. 2629DE

1.1.4. Features are larger on the orthophoto map than on the topographical map because the orthophoto map ..... (1x1)1

- A. Is bigger
- B. Has a smaller scale
- C. Covers a large area
- D. Has a large scale



1.1.5. The features found at grid reference  $26^{\circ}33'44''\text{S}$ ,  $29^{\circ}55'36''\text{E}$ . ..... (1x1)1

- A. Dry pan
- B. Perennial water
- C. Windmill
- D. Police station

1.1.6. Contour interval of topographic map is ..... meters (1x1)1

- A. 10
- B. 20
- C. 5
- D. 40

1.1.7. Height of trig beacon found in block D2 is ..... meters (1x1)1

- A. 1736.8
- B. 1745.8
- C. 1763.8
- D. 1636.8

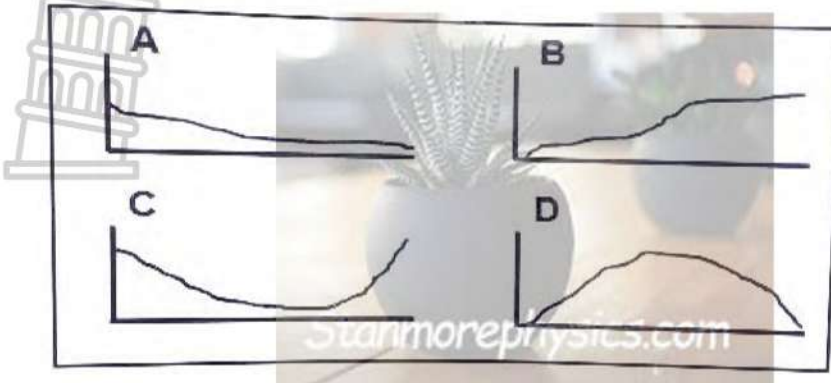
1.1.8. The Earth's curved surface is represented on the topographical map by the ..... projection. (1x1)1

- A. Mercator
- B. Lambert
- C. Gauss conform
- D. Transversal

1.1.9. The magnetic North for this topographical map reveals map was situated ..... in 2022 (1x1)1

- A. East of true north
- B. West of true north
- C. North of true north
- D. South of true north

1.1.10. Refer to spot height 1738 in block B1 and wind pump G in block B3 on the topographic map. The rough cross-section between spot height 1738 and the wind pump is ..... (1x1)1



[10]

**QUESTION 2: MAP SKILLS AND CALCULATIONS:**

2.1. Refer to spot height 1738 in block B1 and wind pump G in block B3 on the topographic map

2.1.1. Calculate the vertical Interval (VI) between spot height 1738 (B1) and wind pump in meters. Show all calculations. (1x1)1

.....  
 .....

2.1.2. Calculate the Horizontal Equivalent (HE) between spot height 1738 (B1) and wind pump (B3) in meters. Show all calculations.

.....  
 .....

(2x1)2

2.1.3. Using the information in questions 2.1.1 and 2.1.2 Calculate the average gradient between spot height 1738 (B1) and spot height(A3). Show all calculations.

.....  
 .....  
 .....  
 .....  
 ..... ( 2x1)2

2.2. Refer to the information on the topographic map

2.2.1 Calculate the Magnetic Declination for 2022. Show all calculations. Marks will be awarded for calculations.

Difference in years :

**Annual Change** :

**Total Change** :

**Mean MD for 2022** :

(5X1)5

2.2.2 Why is it important to calculate Magnetic Declination? Mention Two reasons.

.....  
.....

(2x2)4

2.3. Refer to the area of block A2 on the topographic map. Calculate the area of block A2 on the topographical map in km<sup>2</sup> (area covered by orthophoto map). Show all calculations.



.....  
.....  
.....  
.....  
.....  
.....

( 4x1)4

2.4. Determine the distance in metres from trig. beacon 305 (D2) to trig beacon 309 D4

Formula: Actual Distance = Map distance x Map scale

.....

(1 x 2)2

[20]

**QUESTION 3: APPLICATION OF THE THEORY /MAP AND PHOTO INTERPRETATION**

3.1. Study both the orthophoto and topographical map to answer the questions:

3.1.1. Identify the type landform at block C1 on the orthophoto map

.....

(1x2)2

3.1.2. What is the attitude of the trig beacon found in block D2 of the topographical map?



.....

(1x2)2

3.1.3. Identify the type of recreational activity in block B3/4 on the orthophoto map

.....

(1x2)2

3.2. Study block D3 on the topographical map and answer the following:

3.2.1. Give the general direction in which river in block D3 is flowing

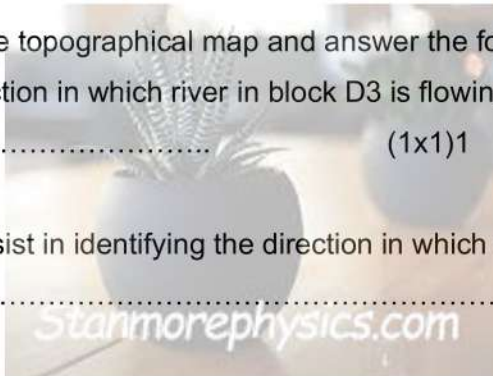
.....

(1x1)1

3.2.2. How do tributaries assist in identifying the direction in which river block D3 flows?

.....

(1x2)2



3.2.3. What kind of slope is depicted by area in block D3

.....

(1x2)2

3.3. Is the area covered by Block E3 suitable for cultivation? Provide evidence from map to justify your answer.

.....  
.....  
.....

(1x3)3

3.4. Give two pieces of evidence from the topographic map that indicates Ermelo has a low rainfall

.....  
.....  
.....

(1x2)2

3.5. Wesselton is residential area located near the sewerage works. Why does the location of the sewerage works decrease the property value of Wesselton?

[ Give any two reasons ]



.....  
.....  
..... (2x2)(4)

**[20]**

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

4.1. Refer to the Ortho photo map which shows spatial resolution.

4.1.1. Define the term spatial resolution (1x2)2

4.1.2. Does the orthophoto show a high or low spatial resolution (1x1)1

4.1.3. Give a reason for the answer in Question 4.1.2? (1x2)2

4.2. Use the topographical map and provide examples of the following vector features

4.2.1. Point (D2)

4.2.2. Line (E3)

4.2.3. Polygon (B2) (3X1)3

4.3. How can GIS assist city planners to determine where a new shopping centre can be built at Ermelo?

(1x2)(2)

**[10]**

**GRAND TOTAL = 60**







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**MEMO** MAPWORK TASK

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stanmorephysics.com

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**INTRUCTIONS:**

**This memo consist of 8 pages.**

**QUESTION 1: MULTIPLE CHOICE QUESTION**

The following questions are based on 1: 50 000 topographical map \*\*\*\*\*. The orthophoto map may be used. Choose the correct answer and write the letter in the square box.

1.1.1. This map of Ermelo shows Orthophoto map Number..... (1x1)1

- A. 26
- B. 29
- C. 5
- D. 2629

C

1.1.2. 29 in the map index 2629DB refers to ..... (1x1)1

- A. Longitude
- B. Latitude
- C. Gratitude
- D. Code

A

1.1.3. What is the map index South – West of 2629DB? ..... (1x1)1

	45°	30°	15°	30°
15°	2629DF	2629DA	2629DC	
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24°				
15°	2629BB	2629DA	2629DE	

- A. 2629DF
- B. 2629DA
- C. 2629BB
- D. 2629DE

C

1.1.4. Features are larger on the orthophoto map than on the topographical map because the orthophoto map ..... (1x1)1

- A. Is bigger
- B. Has a smaller scale
- C. Covers a large area
- D. Has a large scale

A

1.1.5. The features found at grid reference 26°33'44''S, 29°55'36''E. .... (1x1)1

- A. Dry pan
- B. Perennial water
- C. Windmill
- D. Police station

C

1.1.6. Contour interval of topographic map is ..... meters (1x1)1

- A. 10
- B. 20
- C. 5
- D. 40

B

1.1.7. Height of trig beacon found in block D2 is ..... meters (1x1)1

- A. 1736.8
- B. 1745.8
- C. 1763.8
- D. 1636.8

C

1.1.8. The Earth's curved surface is represented on the topographical map by the ..... projection. (1x1)1

- A. Mercator
- B. Lambert
- C. Gauss conform
- D. Transversal

C

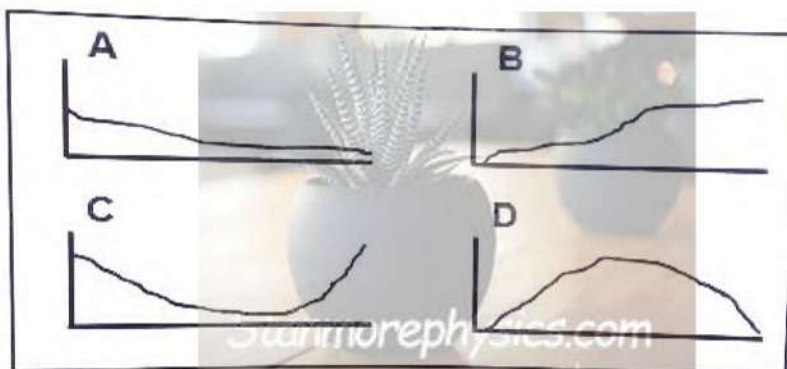
1.1.9. The magnetic North for this topographical map reveals map was situated ..... in 2022 (1x1)1

- A. East of true north
- B. West of true north
- C. North of true north
- D. South of true north



B

1.1.10. Refer to spot height 1738 in block B1 and wind pump G in block B3 on the topographic map. The rough cross-section between spot height 1738 and the wind pump is ..... (1x1)1



A

[10]

**QUESTION 2: MAP SKILLS AND CALCULATIONS:**

2.1. Refer to spot height 1738 in block B1 and wind pump G in block B3 on the topographic map

2.1.1. Calculate the vertical Interval (VI) between spot height 1738 (B1) and wind pump in meters. Show all calculations.

$$1738 - 1707 = 31\text{m}\checkmark \quad (1 \times 1)1$$

2.1.2. Calculate the Horizontal Equivalent (HE) between spot height 1738 (B1) and wind pump (B3) in meters. Show all calculations.

$$6.1 \sqrt{\text{cm}} \times 500\text{m} = 3050\sqrt{\text{m}} \quad (2 \times 1)1$$

2.1.3. Using the information in questions 2.1.1 and 2.1.2 Calculate the average gradient between spot height 1738 (B1) and spot height(A3). Show all calculations.

$$\text{Gradient} = \frac{\text{VI}}{\text{HE}}$$

$$= \frac{31}{3050}\checkmark$$

$$= \frac{31}{31} \times \frac{3050}{31}\checkmark$$

$$= 1:98.387\checkmark \quad (2 \times 1)2$$

2.2. Refer to the information on the topographic map

2.2.1 Calculate the Magnetic Declination for 2022. Show all calculations. Marks will be awarded for calculations.

$$\text{Difference in years} : 2022 - 2013 = 9\text{years}\checkmark$$

$$\text{Annual Change} : 4' \text{ Westwards}\checkmark$$

$$\text{Total Change} : 9 \text{ years} \times 4' = 36'\checkmark$$

$$\text{Mean MD for 2022} : 18^\circ 34' + 36'\checkmark = 18^\circ 70' (1^\circ 10')$$

$$= 19^\circ 10' \text{W} \checkmark \quad (5 \times 1)5$$

2.2.2 Why is it important to calculate Magnetic Declination? Mention Two reasons.

- ❖ To find accurate direction $\checkmark\checkmark$
- ❖ To avoid getting lost $\checkmark\checkmark$
- ❖ To determine the true bearing $\checkmark\checkmark$
- ❖ To orientate the map $\checkmark\checkmark$

Any 2

(2x2)4

2.3. Refer to the area of block A2 on the topographic map. Calculate the area of block A2 on the topographical map in km<sup>2</sup> (area covered by orthophoto map).

Show all calculations.

**Area = Length x Breadth**

**Length = ( 3.7cm x 0,5km) = 1.85km✓**

**Breadth= (3,3cm x 0,5km) = 1,65km✓**

**1.85km x 1,65km ✓ = 3,052km<sup>2</sup>✓** ( 4x1)4

2.4. Determine the distance in metres from trig. beacon 305 (D2) to trig beacon 309 D4

Formula: Actual Distance = Map distance x Map scale

**8,8cm ✓ x 500 = 4400m✓** (1 x 2)2

**[20]**

**QUESTION 3: APPLICATION OF THE THEORY /MAP AND PHOTO INTERPRETATION**

3.1. Study both the orthophoto and topographical map to answer the questions:

3.1.1. Identify the type landform at block C1 on the orthophoto map

Valley✓✓ (1x2)2

3.1.2. What is the attitude of the trig beacon found in block D2 of the topographical map?

1763.8m✓✓ (1x2)2

3.1.3. Identify the type of recreational activity in block B3/4 on the orthophoto map

Soccer field / rugby field✓✓ (1x2)2

3.2. Study block D3 on the topographical map and answer the following:

3.2.1. Give the general direction in which river in block D3 is flowing.

North to North-west✓

(1x1)1

3.2.2. How do tributaries assist in identifying the direction in which river block D3 flows?

..... (1x2)2

They join in the same direction

3.2.3. What kind of slope is depicted by area in block D3

Gentle✓✓ (1x2)2

3.3. Is the area covered by Block E3 suitable for cultivation? Provide evidence from map to justify your answer.



.....  
.....  
.....

(1x3)3 Yes ✓ - Water from the river ✓

- Area is / gentle ✓

3.4. Give two pieces of evidence from the topographic map that indicates Ermelo has a low rainfall

- Reservoirs to store water ✓

- Rivers are dammed to store water

- Few if any perennial rivers and many non-perennial river and few rivers ✓ (1x2)2

3.5. Refers to the sewerage works, J in block A3 on the topographic map

3.5.1. The sewerage works are located in the .....

a. Transition zone

b. Rural-urban fringe ✓✓

c. Commercial zone

d. Industrial zone

(1x2)2

3.5.2. Wesselton is residential area located near the sewerage works. Why does the location of the sewerage works decrease the property value of Wesselton?

- Area will be expenditure unpleasant colour / air pollution ✓

- it will reduce aesthetic appeal ✓ (1x4)4

[20]

#### **QUESTION 4: GEOGRAPHICAL INFORMATION SYSTEM (GIS)**

4.1. Refer to the Ortho photo map which shows spatial resolution.

4.1.1. Define the term spatial resolution

Refers to the degree of detail and clarity of an image ✓✓

(1x2)2

4.1.2. Does the orthophoto show a high or low spatial resolution?

High resolution ✓

(1x1)1

4.1.3. Give a reason for the answer in Question 4.1.2?

It shows more detail/ Features are clear ✓✓

(1x2)2

4.2. Use the topographical map and provide examples of the following vector features

4.2.1. Point (D2) Trig beacon/ Windmill ✓

4.2.2. Line (E3) Other Road/River ✓

4.2.3. Polygon (B2) Cultivated lands/dam ✓

(3X1)3

4.3. How can GIS assist city planners to determine where a new shopping centre can be built at Ermelo?

- It can be used to locate the suitable area in which the shopping centre has to be built ✓✓
- It can be used to determine profitably by looking at the income brackets of the people that live in the surrounding area ✓✓
- It can be used to determine routes to the new shopping centre ✓✓ (1x2)2

[10]

GRAND TOTAL = 60

