education

Department:
Education
PROVINCE OF KWAZULU-NATAL

Learner Assistance Revision Booklet

GEOGRAPHY

GRADE 12

MAPWORK

2020

2829AA EERAM

REFERENCE		VERKLARING
National Freeway; National Route		Nasionale Deurpad; Nasionale Roete
Arterial Route		Hoofverkeersroete
Main Road		Hoofpad
Secondary Road; Bench Mark		Sekondêre Pad; Hoogtemerk
Other Road; Bridge		Ander Pad; Brug
Track and Hiking Trail		Dowwe Pad en Voetslaanpad
Railway; Station or Siding		Spoorweg; Stasie of Sylyn
Other Railway; Tunnel		Ander Spoorweg; Tonnel
Embankment; Cutting		Opvulling; Deurgrawing
Power Line		Kraglyn
Built-up Area (High, Low Density)		Beboude Gebied (Hoë, Lae Digtheid)
Buildings; Ruin		Geboue; Murasie
Post Office; Police Station; Store		Poskantoor; Polisiestasie; Winkel
Place of Worship; School; Hotel		Plek van Aanbidding; Skool; Hotel
Fence; Wall		Draadheining; Muur
Windpump; Monument		Windpomp; Monument
Communication Tower		Kommunikasietoring
Mine Dump; Excavation		Mynhoop; Uitgrawing
Trigonometrical Station; Marine Beacon		Peilbaken; Seevaartbaken
Lighthouse and Marine Light		Vuurtoring en Seevaartlig
Cemetery; Grave		Begraafplaas; Graf

REFERENCE		VERKLARING
International Boundary and Beacon		Internasionale Grens en Baken
Provincial Boundary		Provinsiale Grens
Protected Area		Bewarings Gebied
Perennial River		Standhoudende Rivier
Perennial Water		Standhoudende Water
Non-perennial River		Nie-standhoudende Rivier
Non-Perennial Water		Nie-standhoudende Water
Dry Water Course		Droë Loop
Dry Pan		Droë Pan
Marsh and Vlei		Moeras en Vlei
Pipeline (above ground)		Pyplyn (bo die grond)
Water Tower; Reservoir; Water Point		Watertoring; Reservoir; Waterpunt
Coastal Rocks		Kuslynrotse
Prominent Rock Outcrop		Prominente Klipbank
Erosion; Sand		Erosie; Sand
Woodland		Beboste Gebied
Cultivated Land		Bewerkte Land
Orchard or Vineyard		Boord of Wingerd
Recreation Ground		Ontspanningsterrein
Row of Trees		Rye Bome

TOPIC 1: MAP SKILLS

SCALE & HEIGHT

CAPS CONTENT

TOPOGRAPHIC /ORTHOPHOTO MAP SCALE

The scale of the topographic map used by the learners in South Africa is. The scale of the Orthophoto map used by the learners in South Africa is. Maps are always smaller than the area of the ground they represent. The size, by which actual distances on the ground have been shrunk to draw proportionate maps, is known as the scale of the map.

Scale is shown in THREE ways on map:

1. **Word Scale**

   1 : 50 000 = 1 CM on the map represents 50 000 CM on the ground

   1: 10 000 = 1 CM on the map represents 10 000 CM on the ground

   NOTE: Orthophoto Map scale is **5 times larger** than Topographical Map.

   1 : 10 000 is **5 times larger** than 1 : 50 000

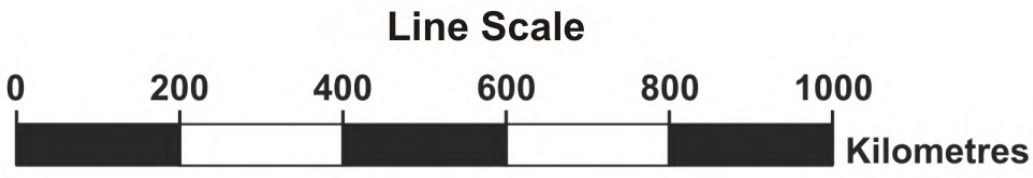
2. Representative Fraction / Ratio: This is a numerical way of showing how greatly ground distances have been reduced. It is also known as a numerical scale. This scale is shown in two ways: e.g.

-

As a fraction, e.g: $\frac{1}{50\ 000}$

- As a ratio, e.g. 1:50 000

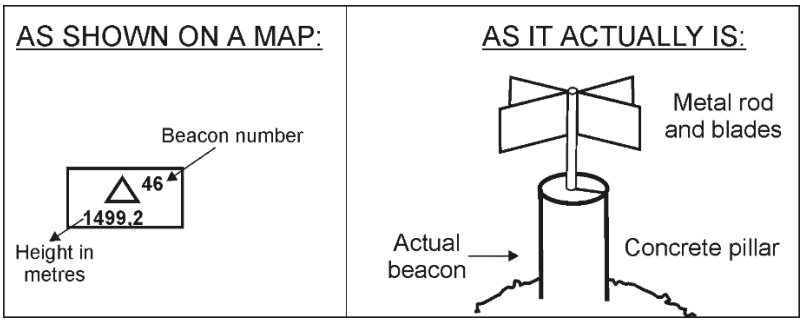
2. **Line Scale**



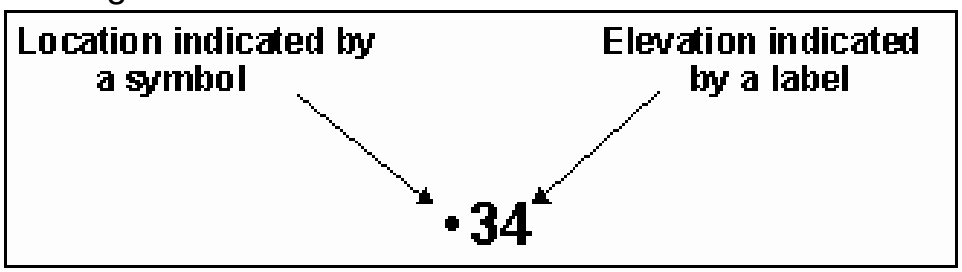
HEIGHT

Height is shown in FOUR ways on the map:

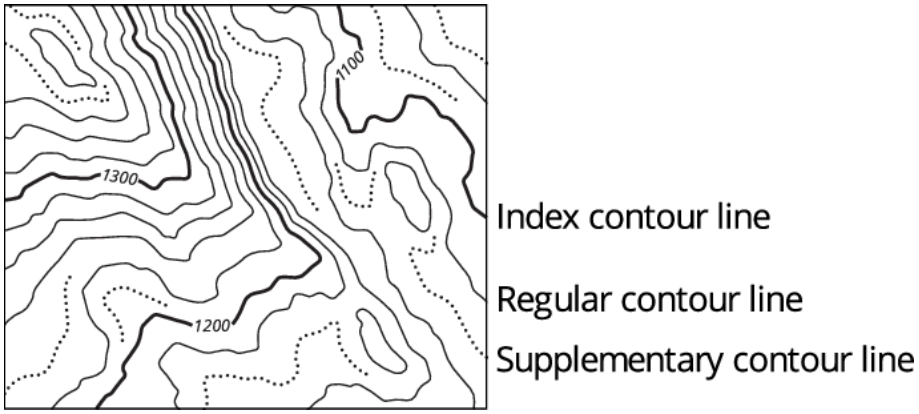
1. Trigonometrical Beacon



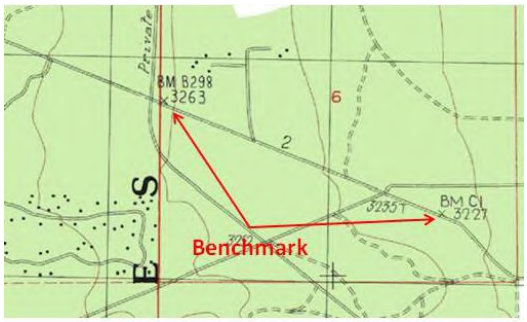
2. Spot Height



3. Contour Line

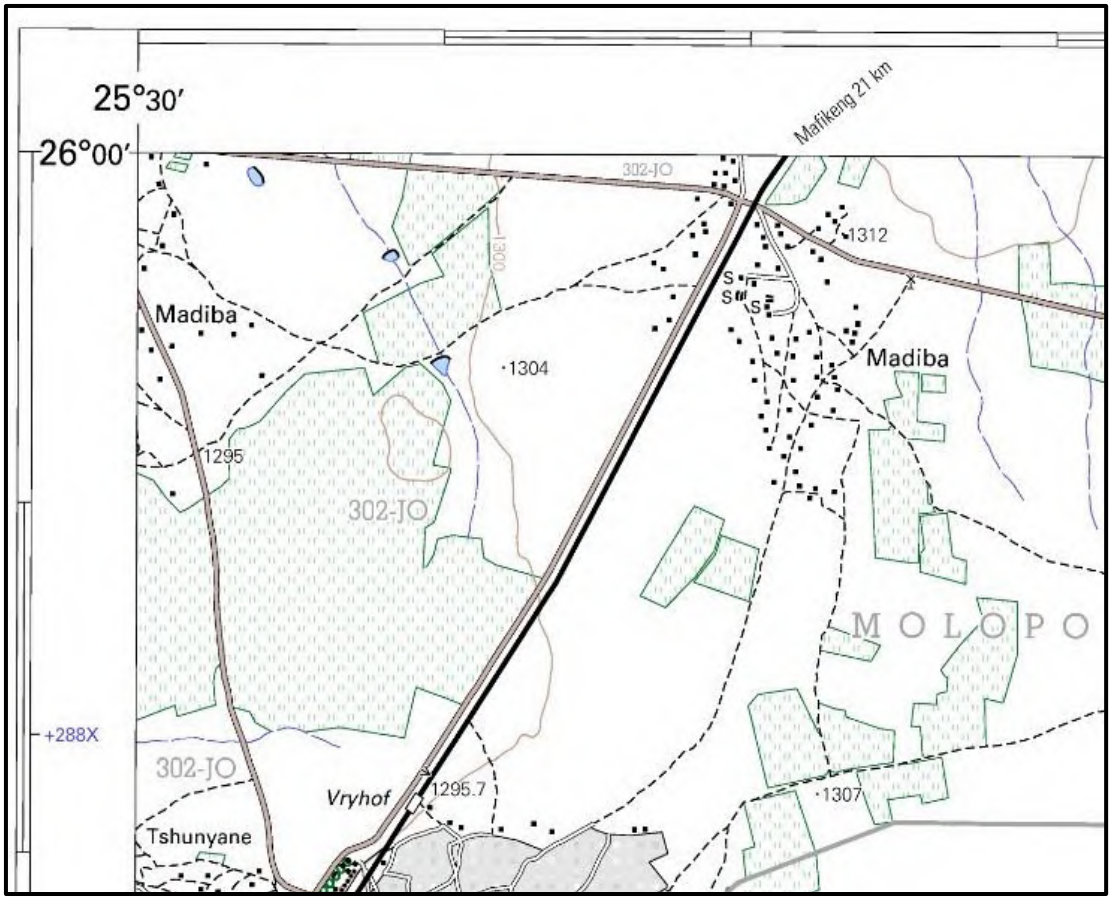


4. Bench Mark



ACTIVITY

Use the following EXTRACT to answer the questions below.



1.1 State the FOUR ways height is indicated on a map.

_____

_____ (4 x 1) (4)

1.2. State the THREE different types of scale:

_____

_____ (3 x 1) (3)

1.3 How many time larger is 1 : 10 000 than 1 : 50 000:

_____ (1 x 1) (1)

1.4 Expree the scale 1: 50 000 as a word scale.

_____ (1 x 1) (1)

TOPIC 2: MAP CALCULATIONS

MAP CALCULATIONS CAPS CONTENT

Learners must be able to do the following calculation:

- Distance
- Area
- Gradient
- Vertical exaggeration
- Magnetic bearing

WEIGHTING AND TIME

Mapwork should be taught on a continuous base and should be integrated with theory. One period per week should be spent on mapwork (about 60 minutes).

METHODOLOGY

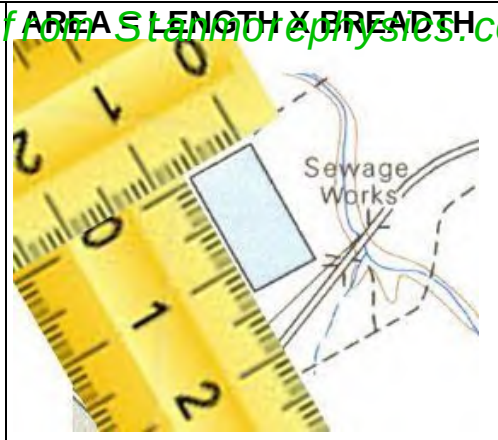
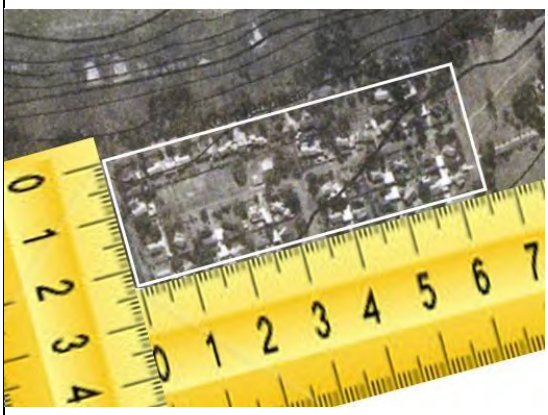
Ensure that you carry your mapwork equipment to school in order to practice the calculation skills regularly. You will need a pencil, ruler, protractor and calculator at least. Ensure that you measure correctly and accurately because it is of utmost importance. Ask your teacher the measurement rules related to mapwork as you practice.

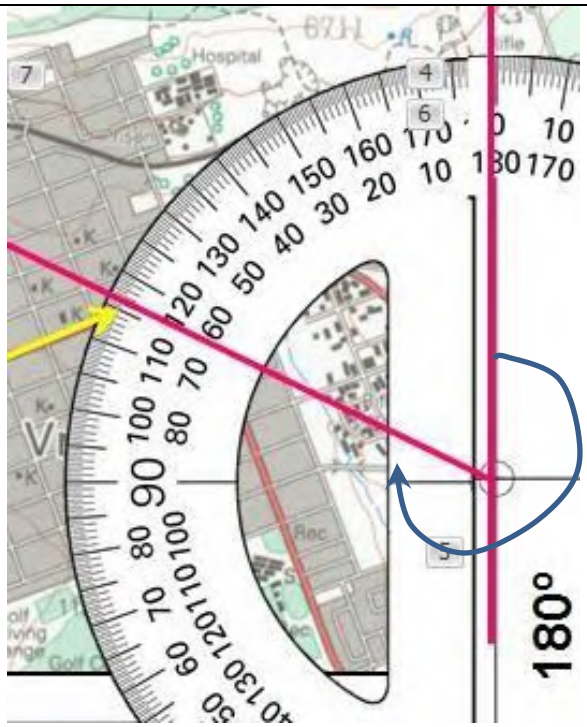
Group work can be very effective when learning mapwork. Make use of the stronger learners to help you understand work more effectively. Ensure that you have your own calculator and stationary.

CALCULATIONS

The table below is a short summary of how to measure and do calculations.

CALCULATION	FORMULA	EXAMPLE
DISTANCE (on map)	**Distance = map distance x scale** 	D = MD X Scale = 3,5 cm X **0.5** = 1**.75 km** D = MD X Scale = 3,5 cm X **500** = **1750 m**
DISTANCE (on orthophoto)	**DISTANCE = MAP DISTANCE X SCALE** 	D = MD X Scale = 6,5 cm X **0.1** = **0,65 km** D = MD X Scale = 6,5 cm X **100** = **650 m**
GRADIENT	**GRADIENT = HEIGHT(H) / DISTANCE (D)** 	HEIGHT (H) = 1515m – 1431m = 84 m DISTANCE (D) = 1.9cm x 500 = 950 m G= H/D = 84 ÷ 84 / 950 ÷ 84 = 1: 11,3 Steep For every 11,3m one walk forward the land rises with 1m

AREA (MAP)	**AREA = LENGTH X BREADTH**  	Length = 1,3 cm x 0,5 = 0,65 m Breadth = 7 cm x 0,5 = 350 m **A = L X B** = 0,65 km x 0,35 km = 0,2275 km^2
AREA (ORTHPHOTO)	**AREA = LENGTH X BREADTH** 	Length = 2,3 cm x 100 = 230 **m** Breadth = 6,5 cm x 100 = 650 **m** **A = L X B** = 230 m x 650 m = 149 500 **m^2**
VERTICAL EXAGGERATION	Vertical exaggeration of cross sections **VE = <u>Vertical scale (VS)</u> Horizontal scale (HS)** VS: given or read from cross section HS: map or photo scale	**VS =** 1cm rep 20m Change to ratio scale *1cm rep (20m x 100) = 2000cm* 1: 2000 VE = $\frac{1 \times 50\,000}{2000 \times 1}$ = 25 times
MAGNETIC DECLINATION	Mean magnetic declination 16°47′ West of True North(July 2002). Mean annual change 7′ Westwards(2000–2005). Supplied by Hermanus Magnetic Observatory. Find the above information on the map. Difference in years: 2020 – 2002 = 18 years Mean Annual Change: 7'W Total change: 7'W x 18 years = 126'W MD (2020): 16° 47'W + 126'W 16° 173'W 16° + 2° 53'W 18° 53'W	

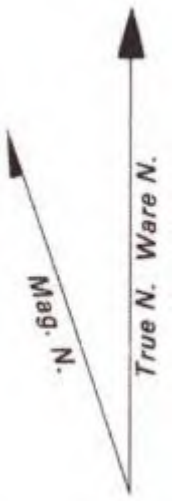
TRUE BEARING		1. Find the place **from** where the measurement must be done. 2. Join the two places. 3. Draw a north line at the **from** point. Accuracy is very important. 4. Place the protractor on the place of departure and measure the angle in a clockwise direction from true north.

ACTIVITY

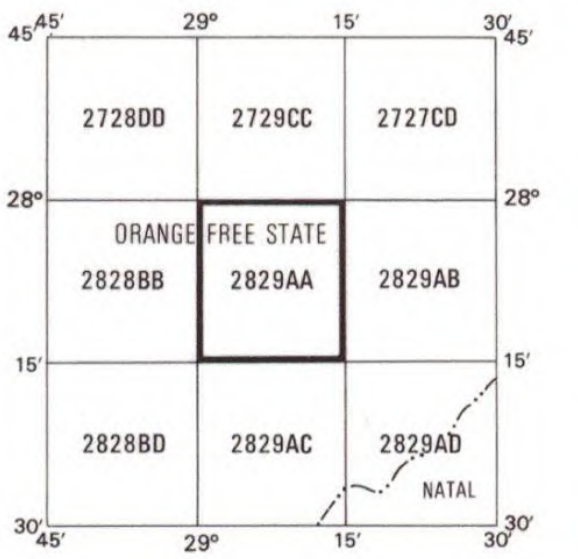
Use the information from the map below to answer the following questions.

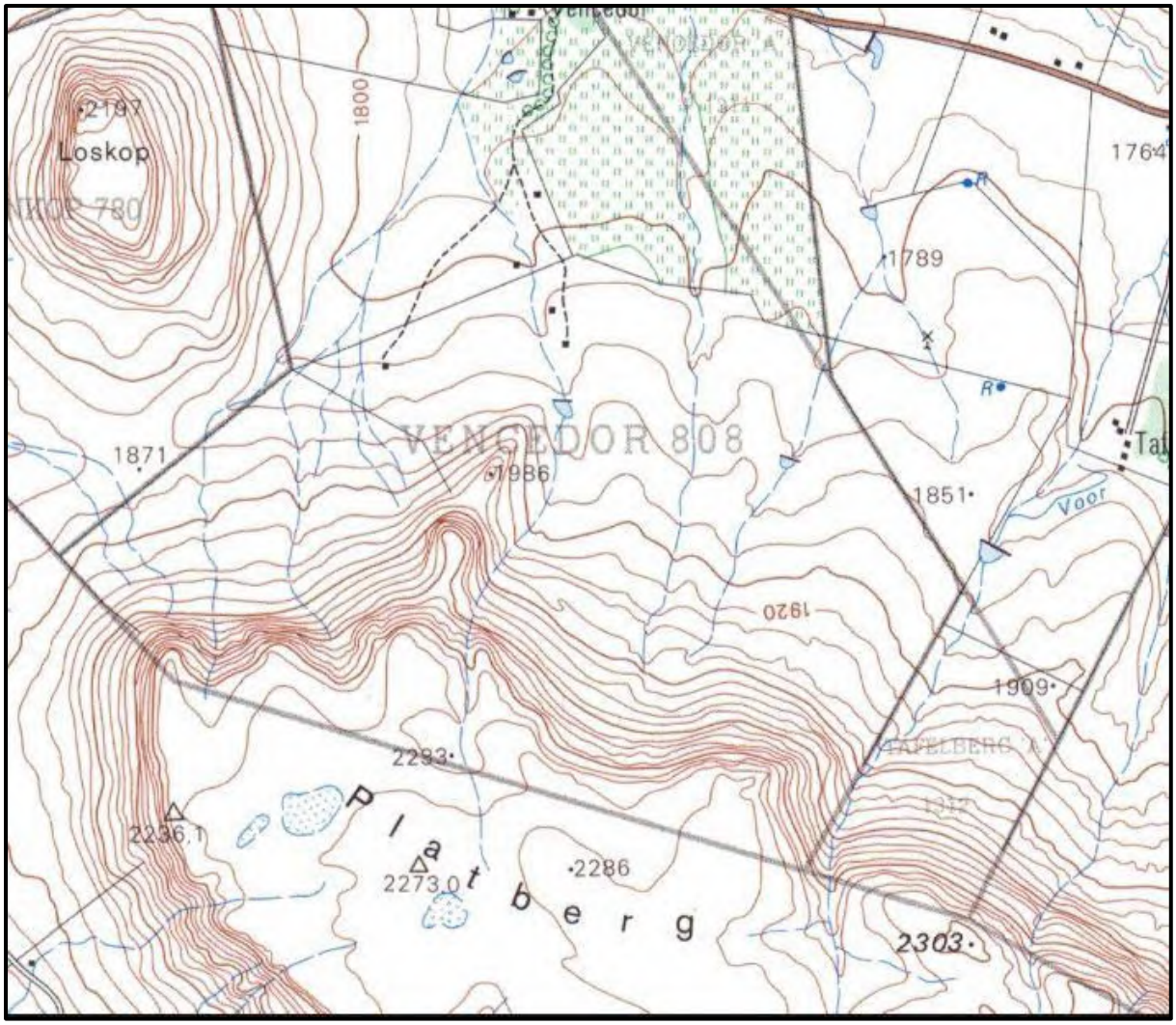
2829AA EERAM 1:50 000 SOUTH AFRICA SUID-AFRIKA

Mean magnetic declination 16° 3' West of True North (2018). Mean annual change 5' Westwards (2016 -2017)



INDEX TO SHEETS INDEKS VAN VELLE





2.1 Calculate the straight line distance distance between spot height 2197 on Loskop and spot height 2293 on Platberg. SHOW ALL CALCULATIONS.

_____

_____

_____

_____

_____

_____

_____

_____

_____ (2 x 1) (2)

2.2 Write the scale 1 : 50 000 as a word scale.

_____

_____ (1 x 2) (2)

2.3 State the map code/index of EERAM.

_____ (1 x 1) (1)

2.4 Calculate the vertical exaggeration on the topographical map if the vertical scale is 1 cm represents 100m. SHOW ALL CALCULATIONS

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____ (5 x 1) (5)

2.5 Calculate the area of the above extract of EERAM in km^2. SHOW ALL CALCULATIONS.

_____

_____

_____

_____

_____

_____ (5 x 1) (5)

2.6 Calculate the magnetic declination for the current year (2020). SHOW ALL CALCULATIONS.

Difference in years: _____

Annual change: _____

Total change: _____

MD (2020): _____

_____

_____

_____ (5 x 1) (5)

SUBTOTAL: 20 MARKS

TOPIC 3: MAP INTERPRETATION

MAP INTERPRETATION CAPS CONTENT

Map interpretation cover all theory related to the 1: 50 000 topographic map series of South Africa. All theoretic content can be assessed in the mapwork exam paper.

WEIGHTING AND TIME

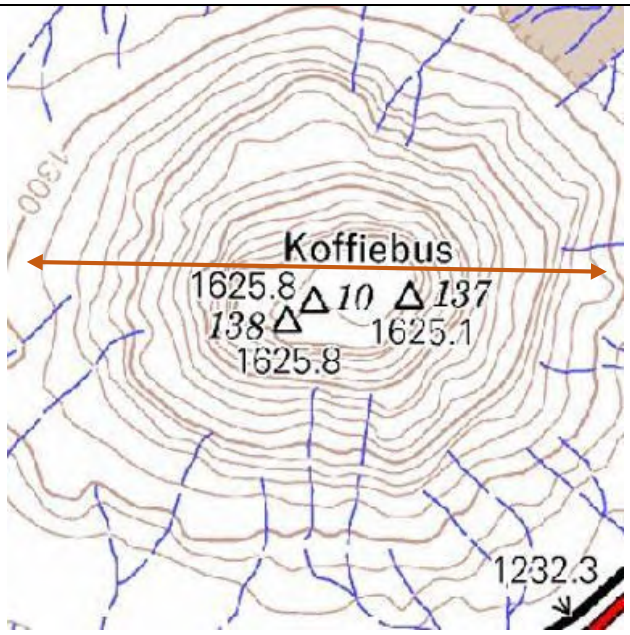
Map interpretation should be included weekly as consolidation activities on the theory taught that can be related to topographic maps.

METHODOLOGY

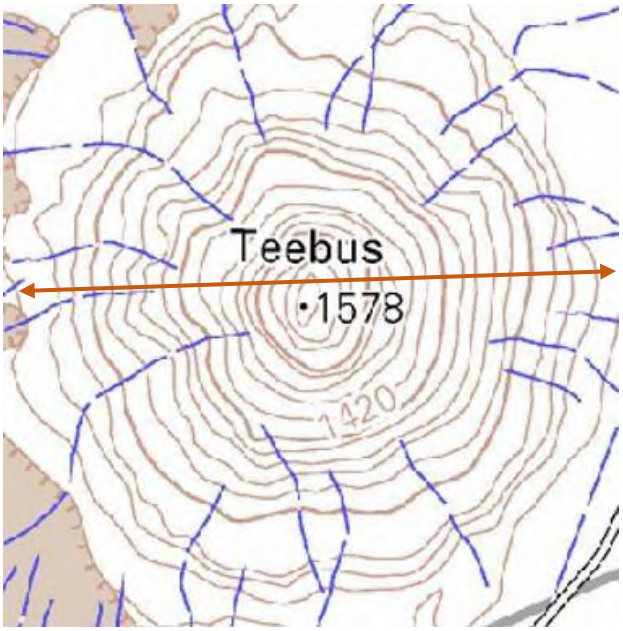
Learners should use variety of topographic maps to their disposal from previous exams to understand and interpret theory on the maps. Map and photo interpretation is a skill that can be improved substantially with enough practice. Always study the map and ask yourself questions like:

- ✓ What is this? (identify, name, label, give, describe, list) ✓ Why is it here? (Explain spatial relations.)
- ✓ How did it develop / form? How will it change / affect …. ✓ What is its function?
- ✓ What does it tell us about the climate, geomorphology, and economy of the area?

LANDFORMS AND OTHER MAP INTERPRETATION EXAMPLES.

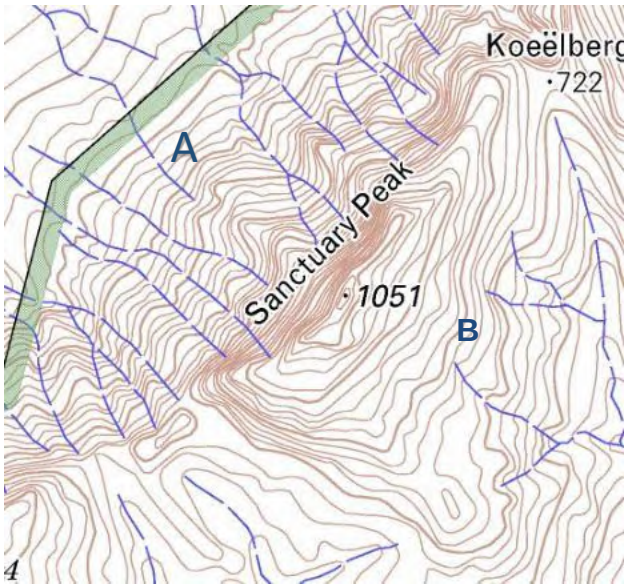
<table>
<tr>
<td> 
</td>
<td>The shape of the contour lines indicate that Koffiebus is a hill.

3.1. Identify the stream pattern that will flow from a hill.

_____(1 x 1) (1)</td>
</tr>
<tr>
<td> 
</td>
<td>3.2 Study the shape of the contour lines and determine the type of landform that Teebus is?

_____

_____ (1 x 2) (2)</td>
</tr>
</table>



3.3 *Sanctuary Peak* is a hill. Side A has a high drainage density compared to side B. State TWO possible reasons for the high density on side A.

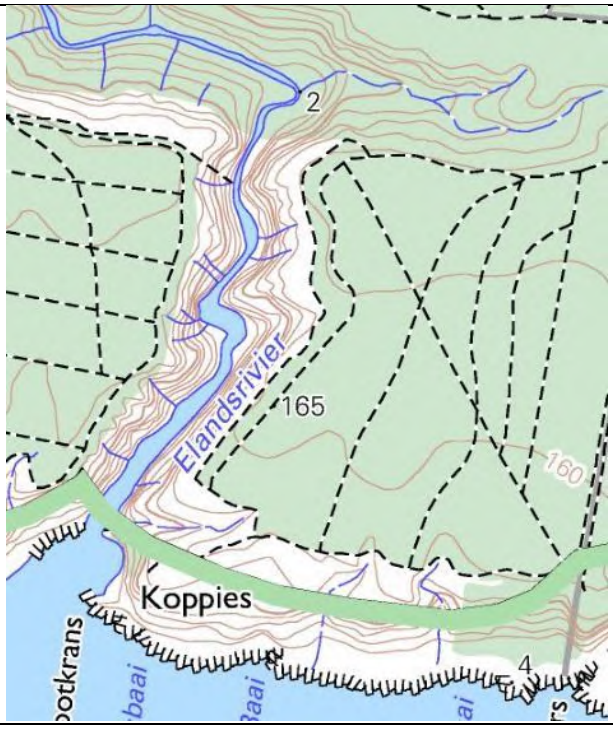
_____

_____

_____

_____

_____ (2 x 1) (2)



3.4 State the direction that *Elandsriver* is flowing in.

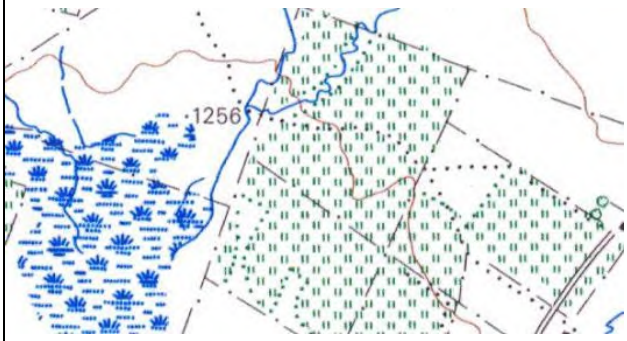
_____ (1 x 1) (1)

3.5 Provide the term used to describe feature 2.

_____ (1 x 1) (1)

3.6 Calculate the stream order at point 2.

_____ (1 x 1) (2)

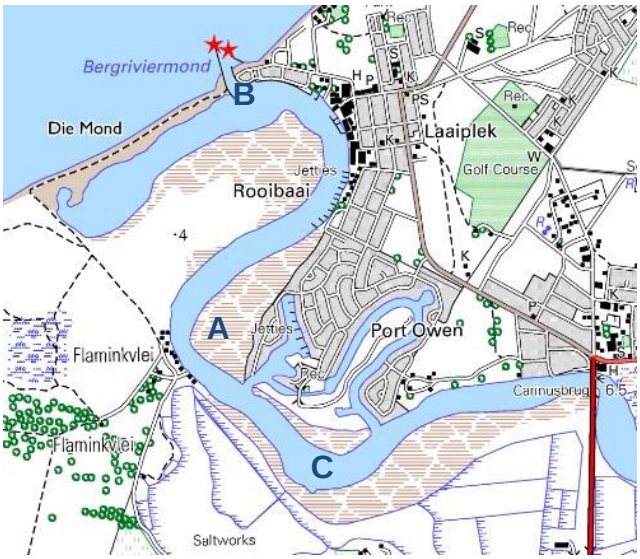


3.7 State ANY ONE importance of the marsh and vlei for the cultivated land.

_____

_____

_____ (1 x 1) (1)

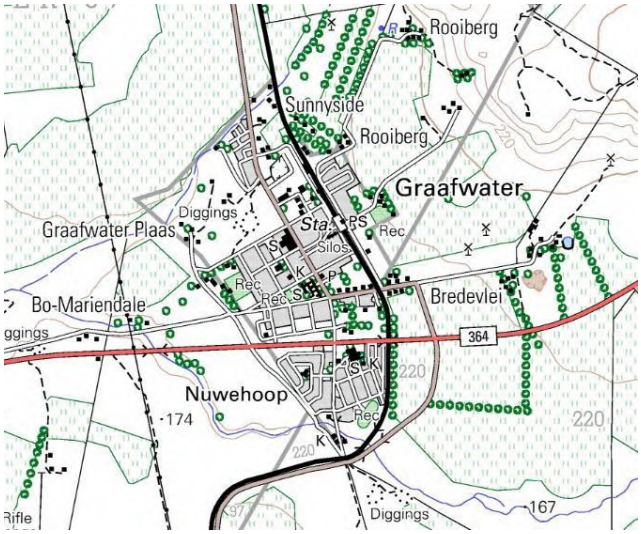


3.8 State the course of the river shown in the diagram.

_____ (1 x 1) (1)

3.9 Is slope A an undercut or slip-off slope?

_____ (1 x 1) (1)



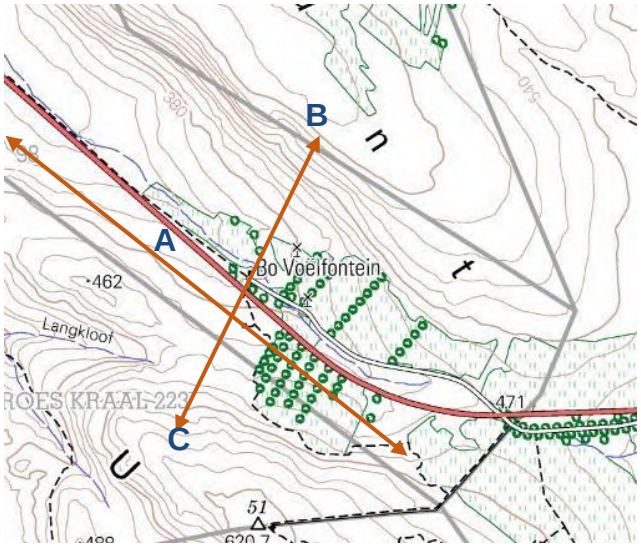
3.10 Graaf water is a central place town. Support this statement with evidence from the map.

_____

_____

_____

_____ (1 x 1) (1)

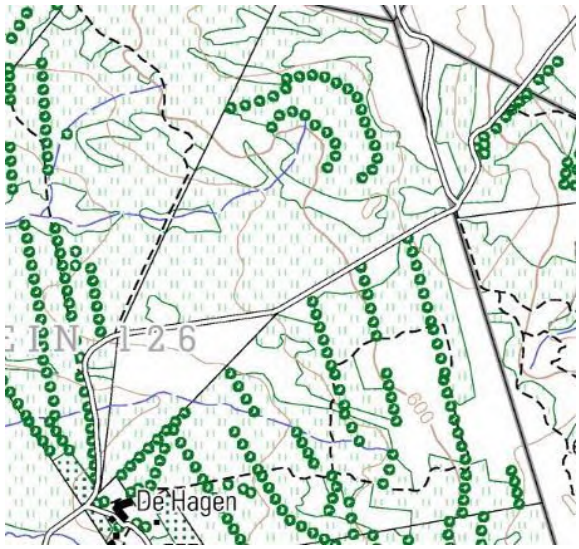


3.11 Line A is a valley floor. State the type of precipitation that will occur at the valley floor during a winters night.

_____ (1 x 1) (1)

3.12 Draw a simple diagram showing katabatic winds in this valley.

(3 x 1) (3)



3.12 Identify the economic activity on the map.

_____ (1 x 1) (1)

3.13 Explain why this area is suited for this economic activity.

_____

_____

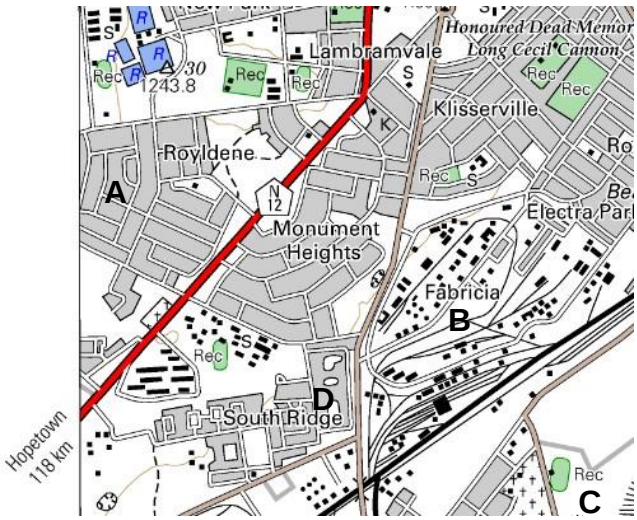
_____

_____

_____(2 x 2) (4)

3.14 What is the function of the rows of trees in this area?

_____ (1 x 1) (1)



3.15 How far is Hopetown from Kimberley?

_____ (1 x 1) (1)

3.16 Identify the land use zones at

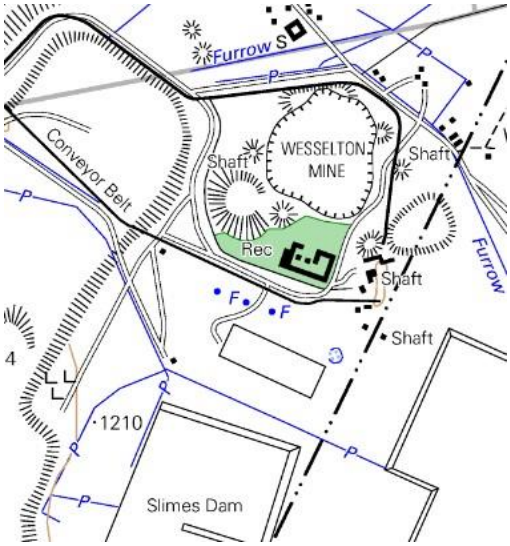
A: _____

B: _____

C: _____

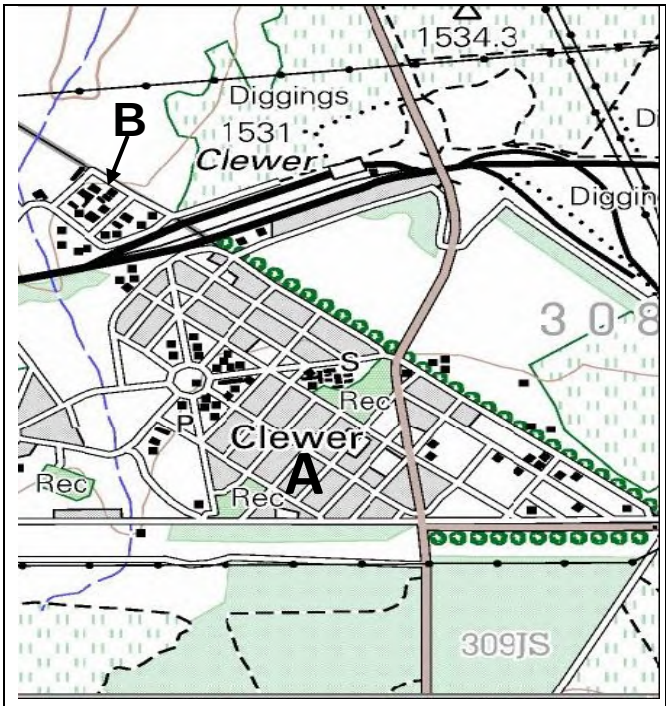
D: _____

(4 x 1) (4)



3.17 What transport method is used to transport raw materials in this area.

_____ (1 x 1) (1)



3.18 Identify street pattern **A**.

_____ (1 x 1) (1)

3.19 State ONE advantage and ONE disadvantage of this pattern metioned in QUESTION 3.18.

_____

_____

_____

_____

_____

_____

_____ (2 x 2) (4)

3.20 Identify settlement pattern **B**.

_____ (1 x 1) (1)

3.21 State ONE advantage and ONE disadvantage of the settlement pattern mentioned in QUESTION 3.20.

_____

_____

_____

_____

_____

_____

_____ (2 x 2) (4)

TOPIC 4: GEOGRAPHIC INFORMATION SYSTEMS

CAPS CONTENT

Learners must know the concepts in GIS as set out in the additional notes below.

PLEASE NOTE:
You are also expected to be able to do the following.
• Developing a 'paper GIS' from existing maps, photographs and other sources of information on layers of tracing paper

You need to be able to apply the concepts to new situations:
• Identify and interpret concepts by using given data such as satellite images, topographic maps, orthophoto maps, aerial photographs, pictures and statistics indicated on graphs and tables

WEIGHTING AND TIME

About 8 hours should be used for GIS, but is should be integrated with mapwork and theory through the year.

METHODOLOGY

They concepts of GIS is often just given to learners to study. Learners cannot make sense of the concept in this way. Today GIS is used around us daily. There is a GIS map system on most smart phones, in shopping centres to find your way in our cars when we drive on the television to show where news events are taking place.

Use these examples to understand the concepts of GIS but always refer back to topographic maps and orthophoto maps, as this is what you will face in the final exams.

You do not need a computer to understand basic GIS concepts.

CONCEPTS OF GEOGRAPHIC INFORMATION SYSTEMS (GIS)

GIS: It is a tool used for capturing, analysing and displaying data.

Remote sensing: Observations from a distance.

Resolution: Refer to detail and clarity of an image.

Pixels: the small squares making up a photograph.

Spatial data: Describe the shape and location of geographical features using coordinates.

Attribute data: Data that is descriptive.

Vector data: Features shown by line, points and polygons.

Raster data: Features shown by shapes.

Data layering: Combining different layers of data

Buffering: Creation of an off-limit zone

Data Manipulation: Change data to make it more useful

Querying: Investigate the data and find answers about specific datasets

Data standardisation: To make the data similar to other data set.

Data sharing: Make data available for other users to access..

Data security: To ensure that data is safe from tampering

COMPONENTS OF GIS

There are FOUR components of GIS:

1. Hardware
2. Software
3. Data
4. User

FUNCTIONAL ELEMENTS

Capture, Store, Update, Manipulate and Analyse Spatially referenced data

SOURCES OF INFORMATION FOR GIS

Aerial photos
Satellite images
Survey data
Census data
Fieldwork

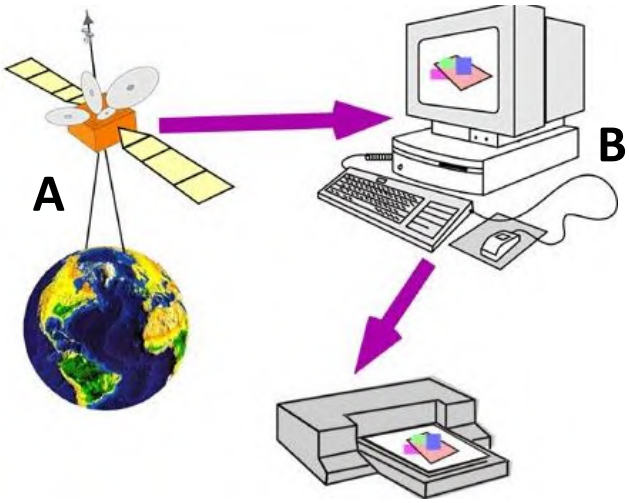
APPLICATION OF GIS BY THE

- ✓ Government: census, elections, planning, budgeting, research, problem solving.
- ✓ Private sector: used to improve productivity and solve any geographical query.

ACTIVITY

Answer the following questions

4.1 Study the figure below and answer the following questions.



4.1.1 Point **A** is a example of Remote Sensing. Define the term *Remote Sensing.*

_____

_____(1 x 1) (1)

4.1.2 Feature **B** is a component of GIS. State this component.

_____ (1 x 1) (1)

4.2 The figure below shows a block on the topographical map. Study it and answer the following questions.

Name the type of vector data used to indicate the road *R33*
(N.B: Vector data is either: point data OR line data OR polygon data)

_____ (1 x 1) (1)

3.2 Use the block to draw paper GIS in each of the blocks below.

POLICE STATION	ARTERIAL ROUTE	CEMETERY

(3 x 1) (3)

2.2 Define the following terms:

Database:

_____

_____ (1 x 1) (1)

Data Layering:

_____

_____ (1 x 1) (1)

Data manipulation:

_____

_____ (1 x 1) (1)

4.4 An urban and regional planner wants to study building density in the maps below. She/He decides to use an orthophoto map instead of a topographical map. Discuss TWO reasons why an orthophoto map is ideal for the study of building density.

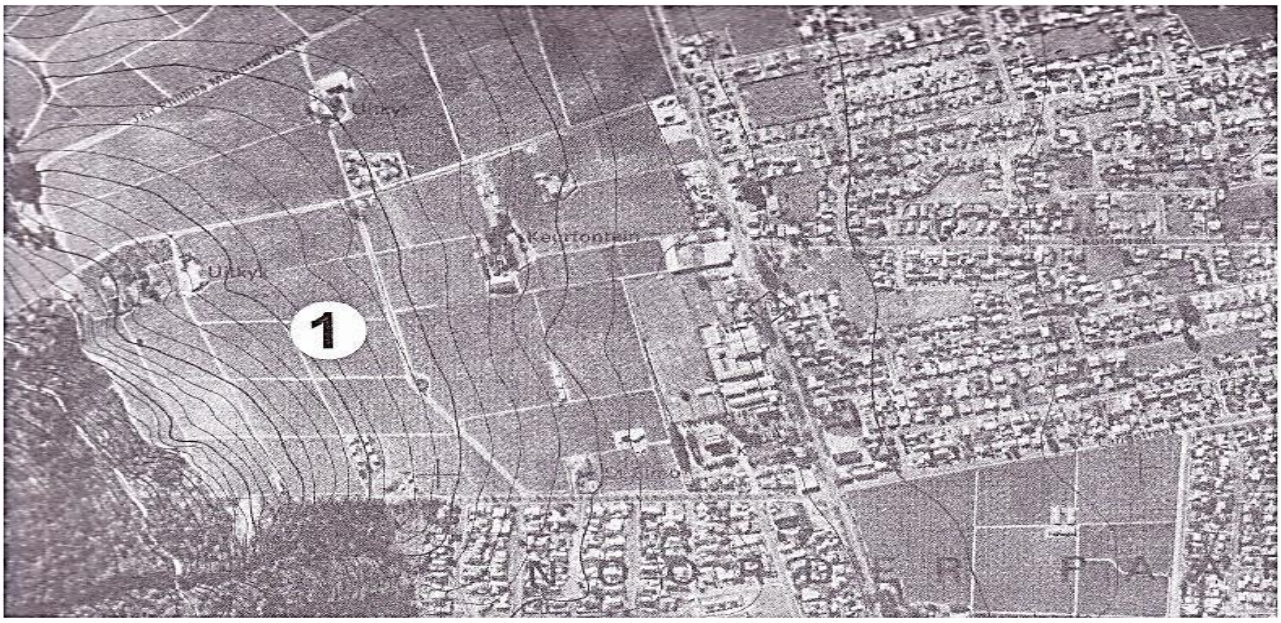
_____

_____

_____

_____ (2 x 2) (4)

EXTRACT OF ORTHOPHOTO MAP



EXTRACT OF TOPOGRAPHICAL MAP