



Western Cape
Government

Education

Directorate: Curriculum FET

TELEMATICS 2017

GEOGRAPHY

Grade 11

Dear Grade 11 Learner

The Telematics Teaching Project stems from cooperation between the Western Cape Education Department and the Stellenbosch University.

To be able to have success at the end of the year it will be very important to keep on learning and applying the prescribed key concepts/processes and process skills in the different knowledge areas throughout the year. Make sure that you are able to analyse and interpret geography related concepts in newspapers and magazines to the concepts and content you have discussed in the classroom. In addition, spend at least a few hours per week studying / reading / making summaries about the four components in the theory section and attempt to integrate it with the mapwork section.

This resource pack includes the following:

- **Theory:** Mindmaps of the lessons that will be broadcast. This is a good summary of your class notes and can help you with your examination preparation.
- **Geomorphology and Mapwork:** Notes, techniques, questions and answers as well as a guideline to calculations.

TELEMATICS TEACHING SCHEDULE FOR 2017

GRADE 11 GEOGRAPHY SUPPORT – FIRST QUARTER			
DATE		TIME	TOPIC
Tuesday	14 February	16:00 – 17:00	Climate

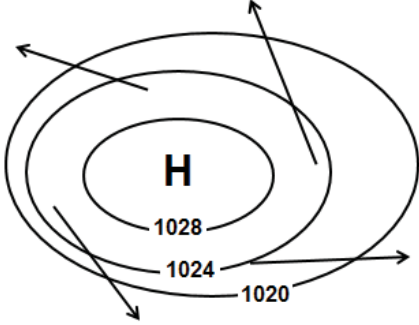
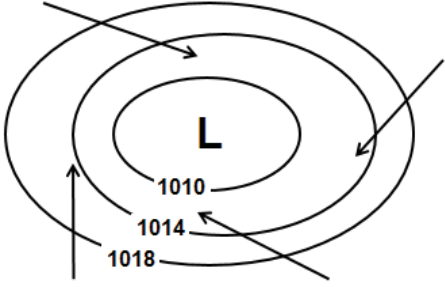
GRADE 11 GEOGRAPHY SUPPORT – FOURTH QUARTER			
DATE		TIME	TOPIC
Wednesday	25 October	16:00 – 17:00	Geomorphology

THE ATMOSPHERE

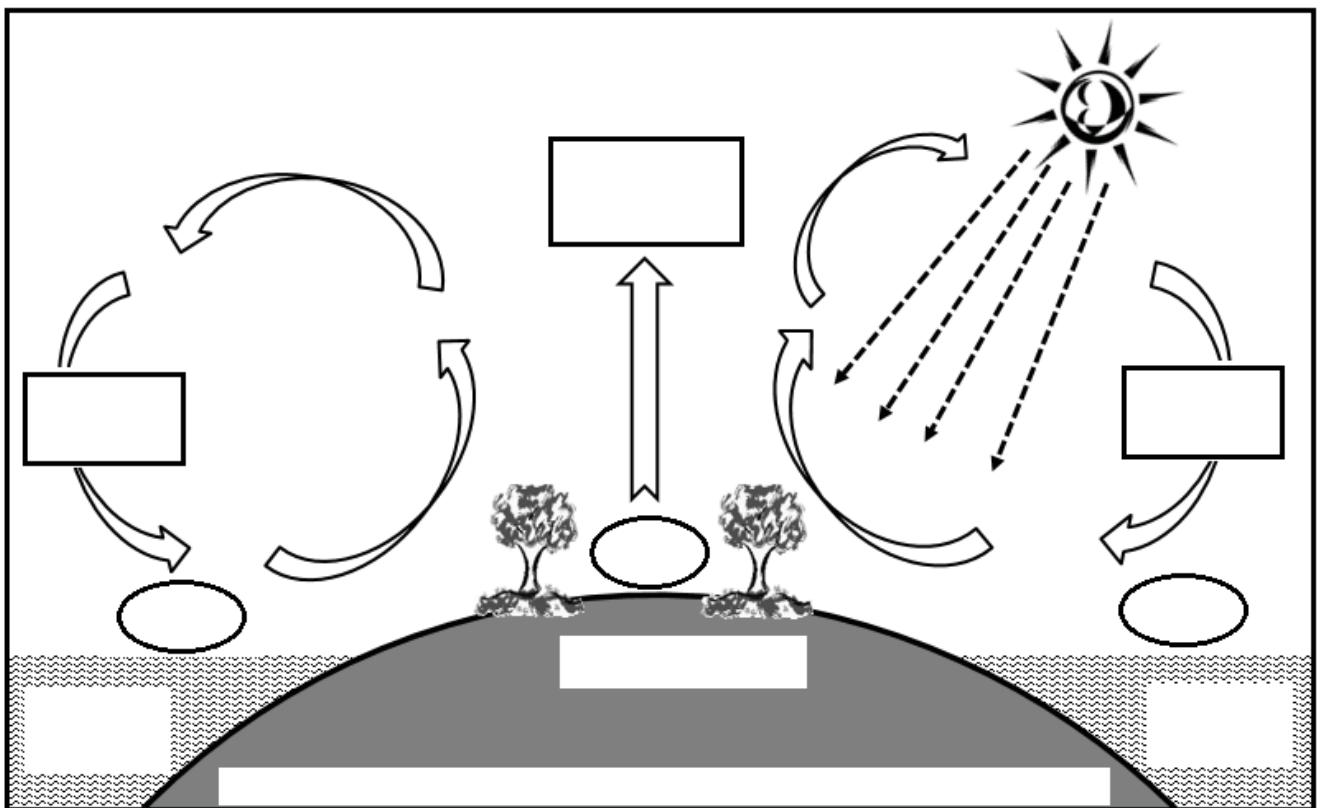
GLOBAL AIR CIRCULATION

1 High and low pressures

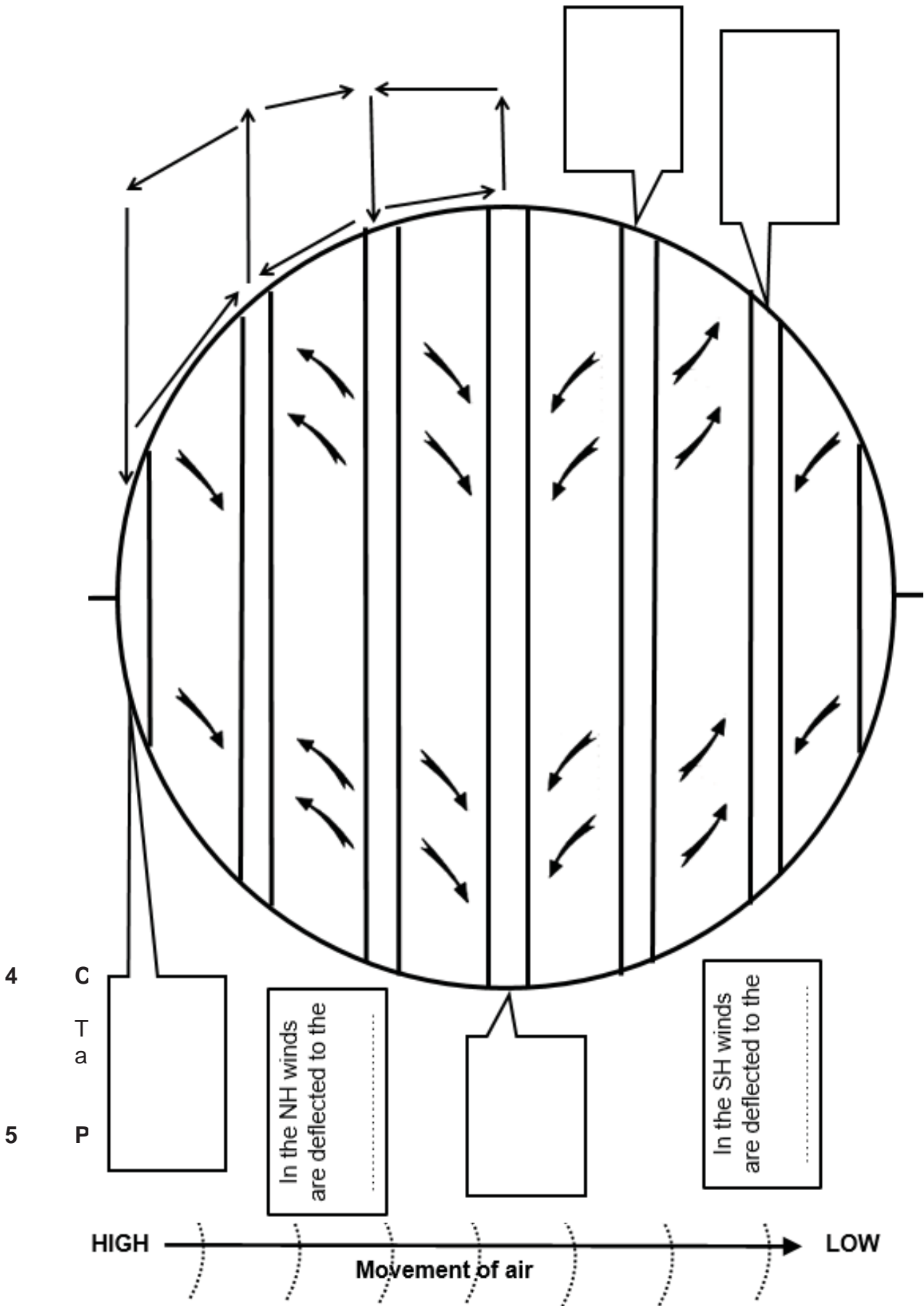
Complete the table below by choosing the following words: Cyclone; Anticyclone; Sinking air; Rising air; Clockwise in the Southern Hemisphere; Anticlockwise in the Southern Hemisphere.

	HIGH PRESSURE	LOW PRESSURE
Appearance on synoptic weather map		
Type of air movement		
Air movement around the system		
Other names		

2 Relationship between air temperature, air pressure and wind



3 World pressure belts, Tri-cellular circulation and global air circulation

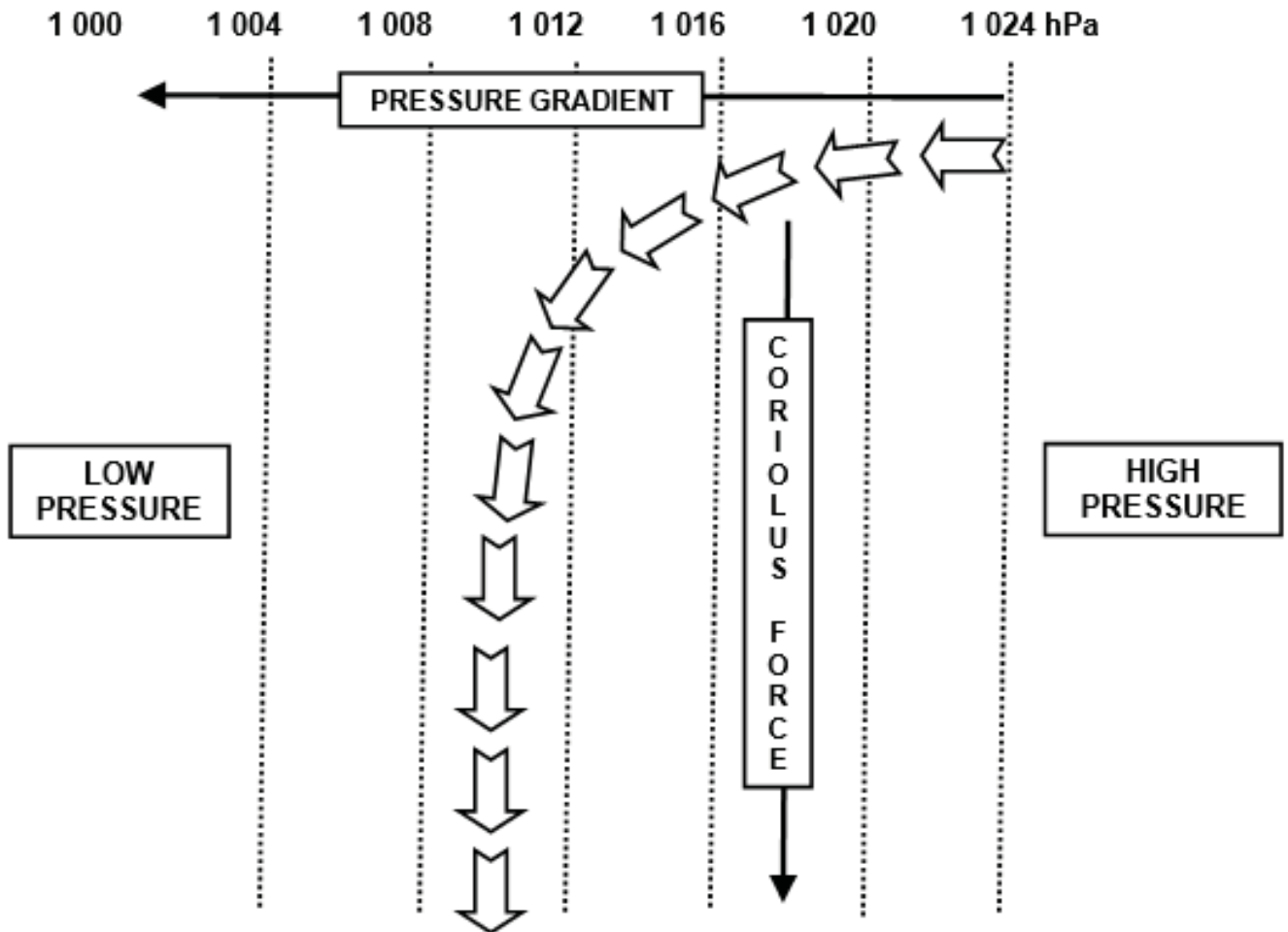


The force that causes air to move from to a pressure

6 Geostrophic flow

How do the Coriolus force and pressure gradient together affect wind direction?

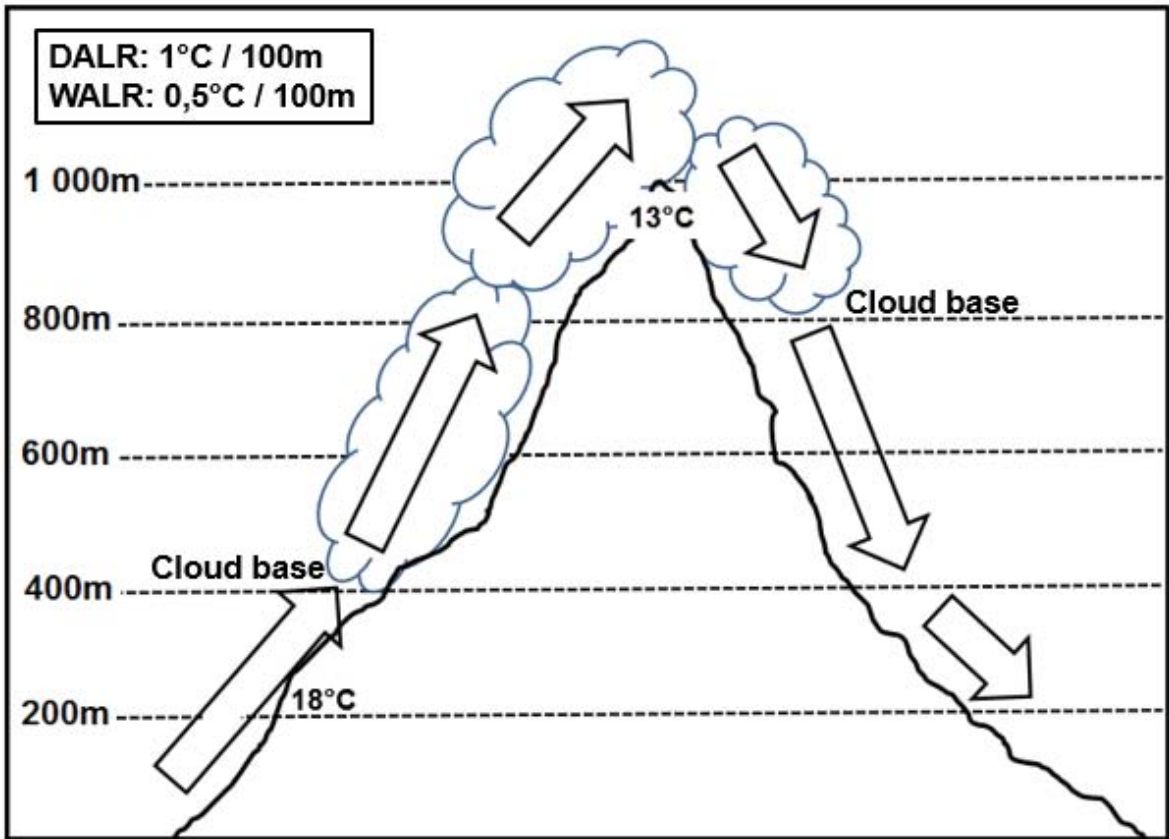
The diagram represents the movement of air in the **SOUTHERN HEMISPHERE**



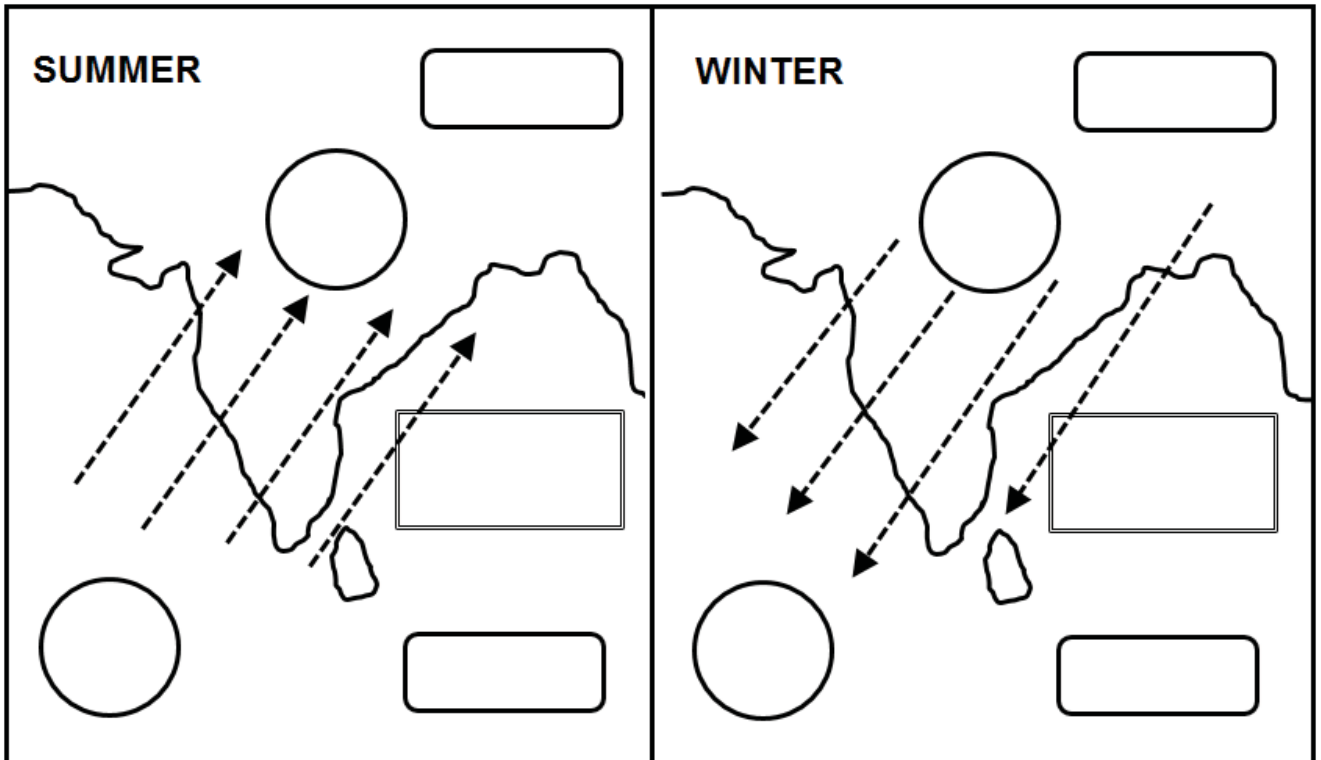
Geostrophic wind is caused by the combined effects of pressure gradient and Coriolus force

7 Föhn winds

Föhn is a general name used for any dry, hot wind that originates in a mountainous area.



8 MONSOON WINDS



GEOMORPHOLOGY

1 STRUCTURAL LANDSCAPES

HORIZONTAL LAYERS

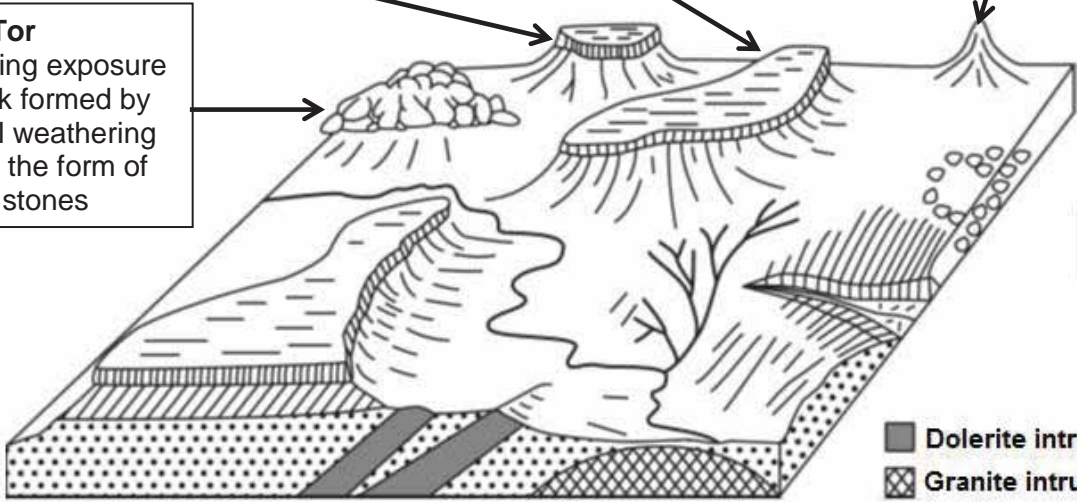
How buttes, mesas and conical hills are formed

Butte
Mesa eroded to form a small flat-topped hill. Has a hard top layer

Mesa
Rivers dissect plateau into large blocks. Has a hard top layer

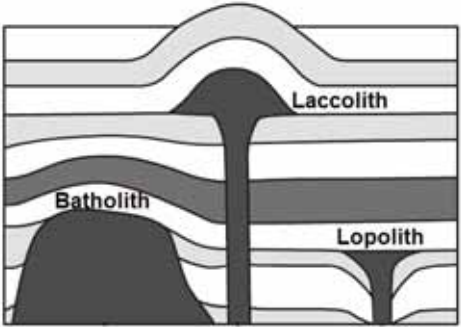
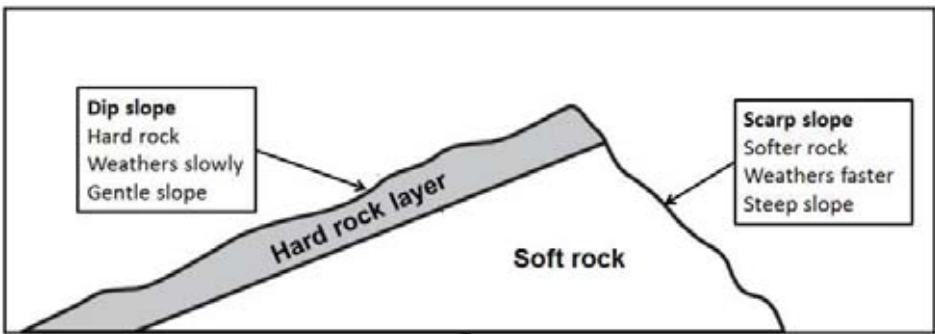
Conical hill
Pointed hill after the hard top of a butte has been removed by erosion

Tor
Freestanding exposure of bedrock formed by differential weathering usually in the form of core stones

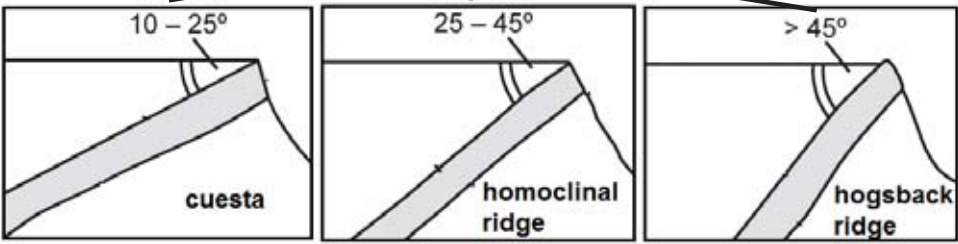


INCLINED LAYERS

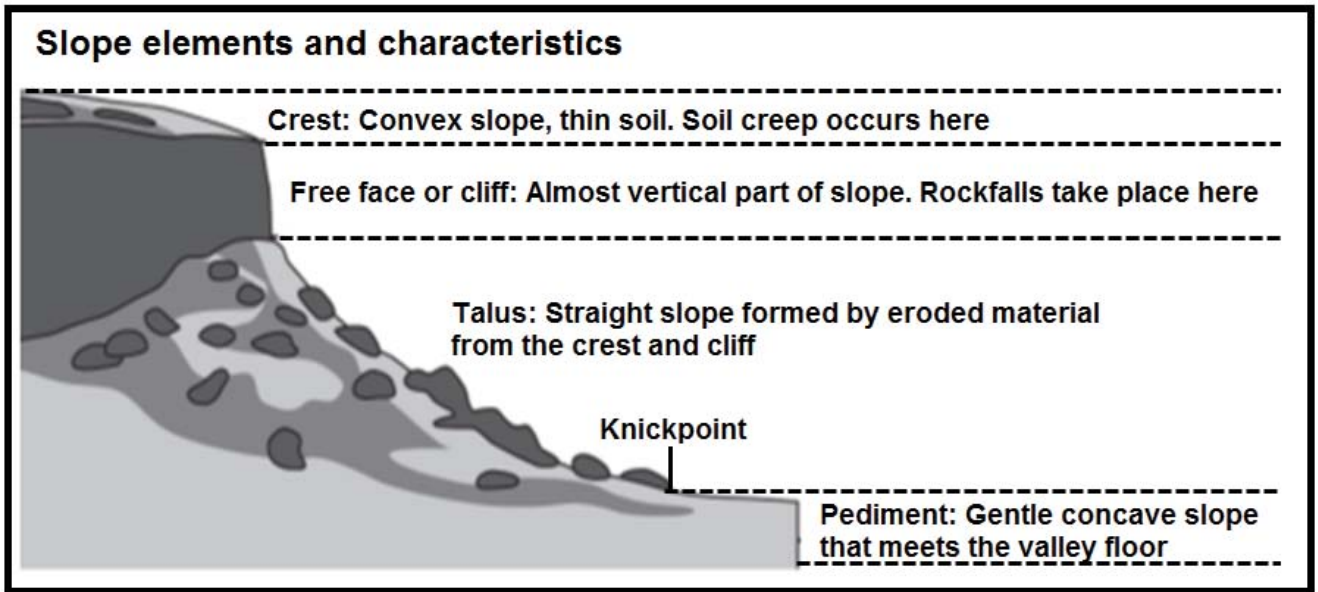
MASSIVE IGNEOUS ROCKS



Batholith: Very large structure of irregular shape
Laccolith: Mushroom shaped
Lopolith: Saucer shaped

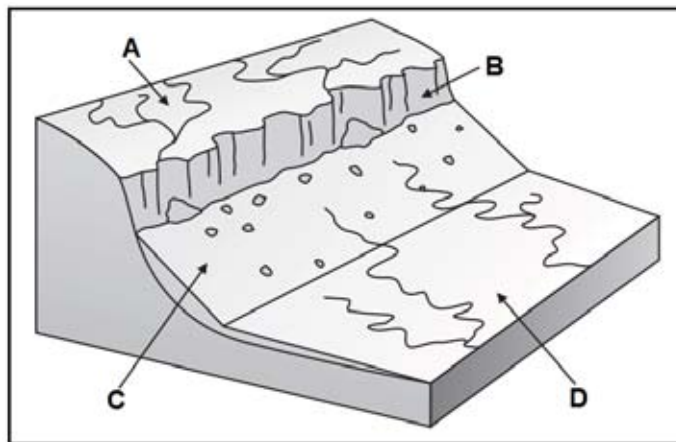


2 SLOPES



ACTIVITY

Study the diagram below and complete the table regarding slope elements and characteristics



	A	B	C	D
Slope element				
Shape				
Process				

Indicate the position of the knickpoint with X.

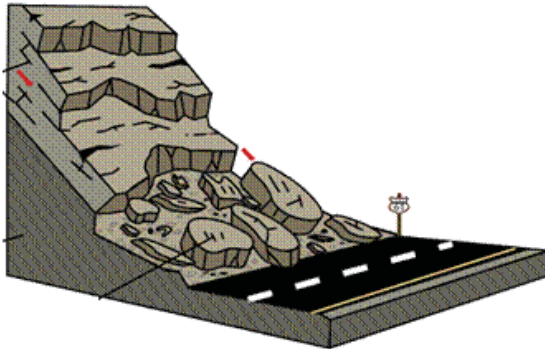
3 MASS MOVEMENT

DEFINITION
The movement of weathered materials down a slope

M A S S M O V E M E N T

EVIDENCE OF MASS MOVEMENT

- Tilted telephone poles
- Broken fences
- Cracks in tiles and walls
- Doors and windows stuck



EFFECTS OF MASS MOVEMENT

- Damage to railroads, buildings
- Expenses
- Loss of productivity
- Interruption of transport
- Road closures

STRATEGIES

- Restrict activities on slope
- Plant natural vegetation
- Engineering techniques
- Safety nets to stop rock falls
- Stabilise slopes
- Drain excess water
- Reduce deforestation
- Fasten unstable rocks

TYPES OF MASS MOVEMENT

Soil creep

Very slow downslope movement of soil. Difficult to notice. Takes place at a rate of 1mm a year.

Solifluction

Very slow down-slope movement of water saturated soil. Occurs in arid regions when debris become saturated with water.

Landslides

Occurs when a large mass of land breaks loose and plunges down a slope. Causes great economic loss through destruction of infrastructure.

Rock falls

Very rapid movement of material on slopes exceeding 40°. Rocks break loose due to weathering frost action and earth quakes. Rocks collect at the bottom of the slope

Mud flows

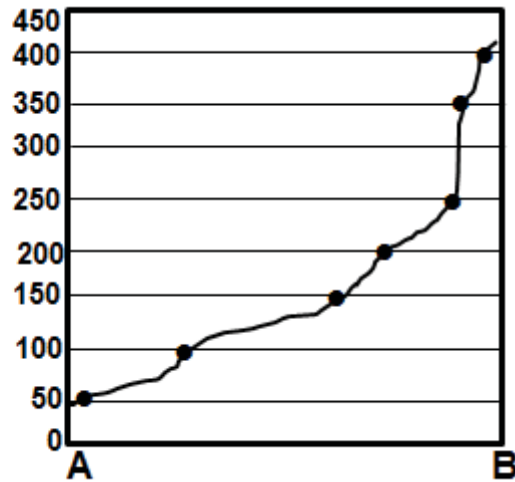
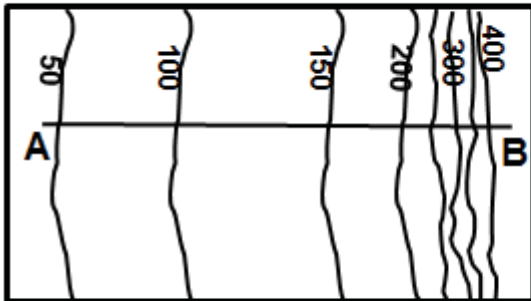
Occurs on steep slopes after heavy rain. Like a stream of mud and exceeds 1 km/h. Happens in arid regions after heavy rain fall.

Slumps

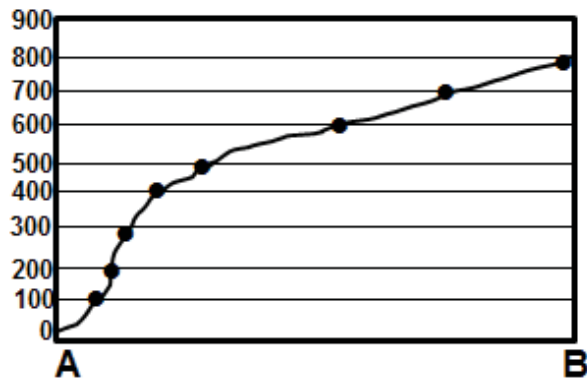
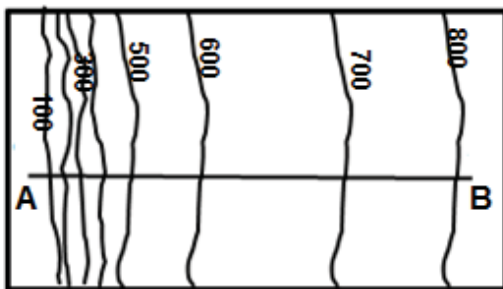
Slope failure involving rotational movement. Occurs in areas where softer materials overlie more resistant rocks.

- Contour lines join places with the same height above sea level.
- Contours far apart show a gentle slope.
- Contours close together show a steep slope

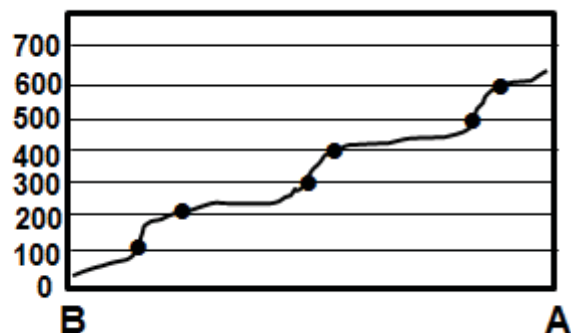
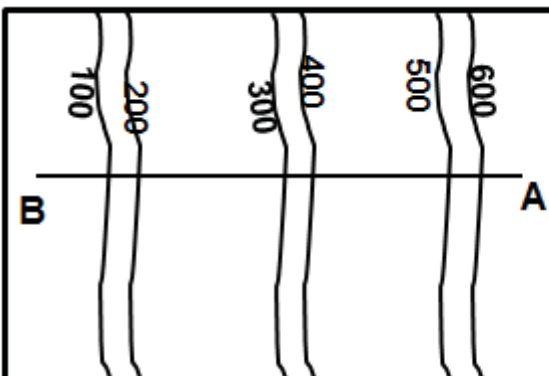
1.1 Concave slope



1.2 Convex slope

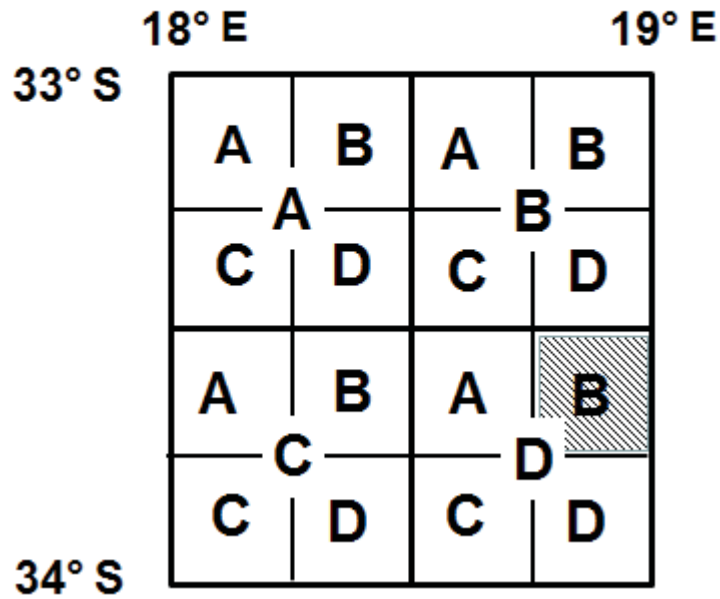


1.3 Terraced slope

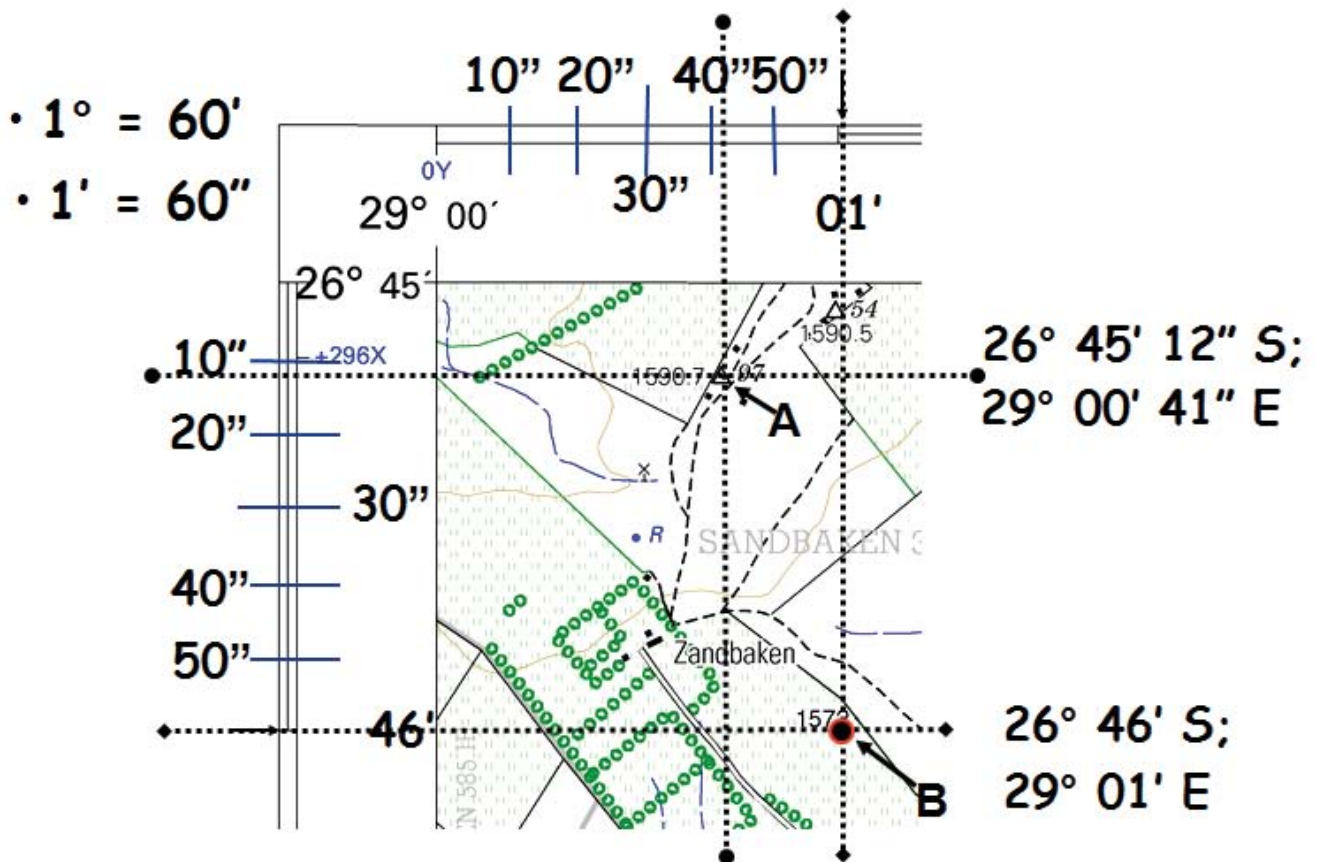


2 MAP REFERENCE

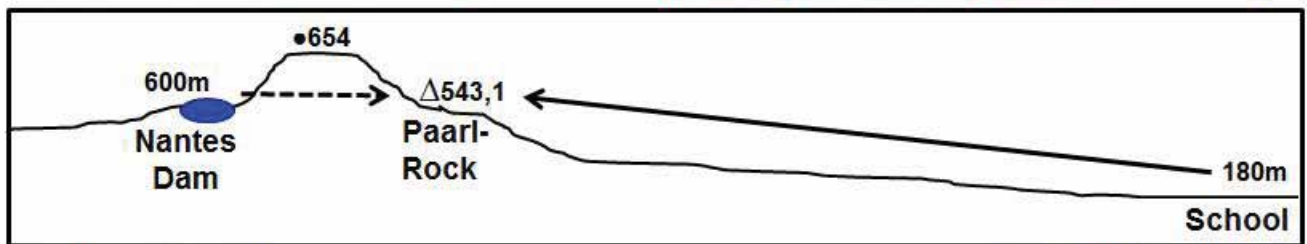
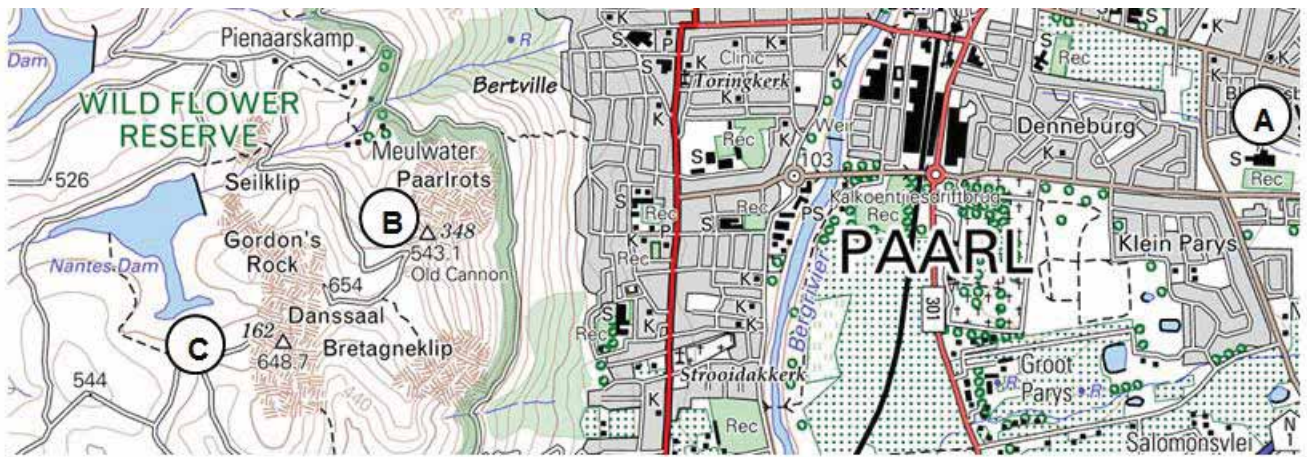
3318DB PAARL



3 LOCATION IN DEGREES, MINUTES AND SECONDS



4 INTERVISIBILITY

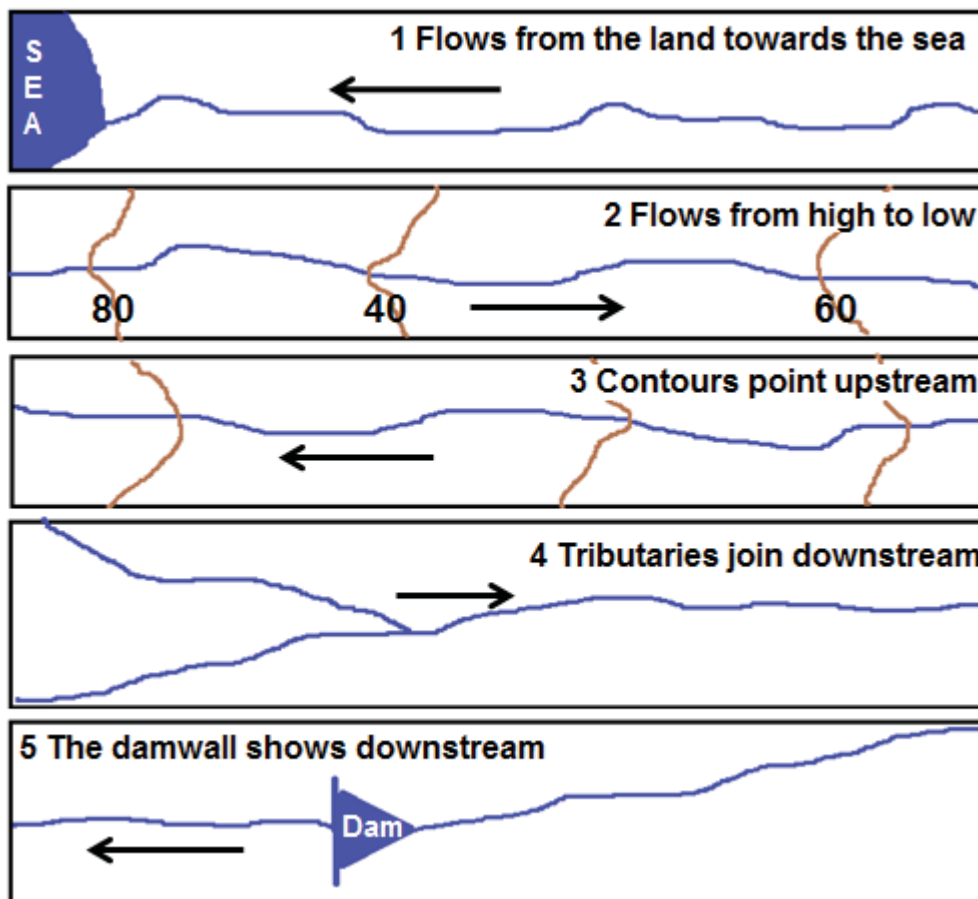


Paarl Rock is not visible from the dam

Paarl Rock is visible from the school

5 DIRECTION OF RIVER FLOW

The following methods can be employed in determining the direction of river flow.



READ AND INTERPRETATION OF MAPS AND ORTOPHOTOS

The goal of this guide is to empower you with regard to the answer of interpretation questions in mapwork. Remember that there is a large amount of information on the topographical- and orthophoto map. To answer these questions successfully, you must know what to look at to get to the answer. Most of these questions come from previous exam question papers. Other questions have also been included. Remember that this is not a memorandum which has been given with the questions, but an attempt **to show what you should look at to get to the answers**. It is important to take note that **ALL** content, modules and skills can be assessed in the mapwork paper. Use this guide to study and prepare yourself for the mapwork question paper (Paper 2).

CLIMATOLOGY

- 1 Does the area receive seasonal rainfall or rainfall throughout the year?**
Seasonal: Non-perennial rivers/ dams/ cultivated lands near rivers/ irrigation/ furrows
- 2 Which slope is the warmest?**
The northward-facing slope – identify the northward-facing slope
- 3 In which direction will an airplane take off and land?**
(Remember that airplanes take off and land against the wind.)

GEOMORPHOLOGY

- 1 Physical aspects influencing the construction of railways and roads.**
Mountains/ steep slopes/ marshes/ rivers/
- 2 In which direction does the river flow?**
 - To the sea
 - Always from high to low
 - Contours bend upstream
 - Dam wall on downstream side
 - Tributaries join at acute angles
- 4 Identify the landforms regarding structural landscapes:**
 - Horizontal layers: Mesas/ buttes/ conical hills
 - Inclined layers: dip and escarp slopes
 - Massive igneous rocks: dome-shaped landforms
- 5 In which direction do the layers dip?**
Layers always dip in the direction of the GRADUAL slope

ENVIRONMENTAL STUDIES AND SUSTAINABILITY

- 1 **Evidence of nature conservation**
Nature reserve/ hiking trail/ fire break/ game reserve
- 2 **Evidence of conservational farming.**
Anti-erosion walls/ camps/ rows of trees to reduce wind/ contour ploughing
- 3 **Are there sources of air pollution in the area??**
-Air pollution: Industries
-Noise pollution: Airport
-Water pollution: Factories / camping sites/ Power station near river

ECONOMIC GEOGRAPHY

(a) PRIMARY ACTIVITIES (FARMING / MINING)

- 1 **Commercial or subsistence farming?**
Commercial: Good infrastructure/ irrigation/ large farms/ farm names/ cellar/ dipping tank/ experimental farm/ estate/ sugar mill/ service rail/ abbatoir/ dairy
Subsistence: Few roads/ footpaths/ no power lines/ small patches of cultivated land
- 2 **Describe factors that advantage/disadvantage farming activities**
Advantage: Rivers/ dams/ flat land/ power lines/ railway lines
Disadvantage: Steep slopes/ water scarce/ marshes
- 3 **Identify mining activities**
Excavations/ mine dump/ conveyer belt/ terraces/ names of mines/ old mines/ subsiding ground
- 4 **Identifying of fishing activities**
Fishing harbours/ fishermen's houses/ factories near coast
- 5 **Identifying of forestry**
Trees/ woodlands/ saw mill/ lookout towers/ fire break/ state forest

(b) SECONDARY ACTIVITIES (INDUSTRIES)

- 1 **Describe the factors that influenced the location of the industries**
Flat surface/ raw material/ Transport(name the types)/ power (power station, power lines, coal mines)/ water/ labour(residential areas)/ Market/ outskirts/
- 2 **Heavy or light industries?**
Heavy: Far from CBD/ railway transport/ Raw material-mining/ large spaces/
Light: close to CBD / road transport/ raw material - farming

(c) TERTIARY ACTIVITIES (SERVICES)

1 *Tourist attractions, holiday resorts, camping sites*

Close to beaches/ close to road railway/ wine tasting/ historical buildings/ monuments/ museums

2 *Types of services found*

Electricity supply/ telephone/ medical/ post office/ education (school/ college/ university) transport (roads airport railway)/ police services etc. (buildings on map)

3 *Recreation facilities?*

Golf course/ athletics/ rifle range/ racing track/ etc

4 *Factors that determined the location of the airport*

Flat area/ far from built-up area for safety/ noise/ roads/

5 *Does the railway line and the road follow the same routes? Why not?*

The same? NB influence of topography

Road: through mountain pass . Railway around mountain (between Paarl and Worcester)

6 *For what is the dam on the map used? Give reasons*

Drinking water: Water purification works

Irrigation: canals and furrows

Recreation: Yacht club, Hotels at dam, camping site, caravan park, slipway, etc.

SETTLEMENT

1 *Why is the settlement located there?*

Flat area/ roads/ river/ mountain/ sea/ etc

2 *Is it an urban or a rural settlement?*

Rural: Primary activities

Urban: Secondary and Tertiary activities

CALCULATIONS

DISTANCE

$$\text{FORMULA: Distance} = \frac{\text{Map distance} \times \text{Scale}}{100\ 000}$$

Calculate the length of the national road from A to B.



STEP 1
Measure distance on map
in cm

$$\text{Distance} = 4,8\text{cm}$$

STEP 2
Place in Formula

$$\text{Distance} = \frac{\text{Map distance} \times \text{Scale}}{100\ 000}$$

$$= \frac{4,8 \times 50\ 000}{100\ 000}$$

$$= \frac{4,8}{2}$$

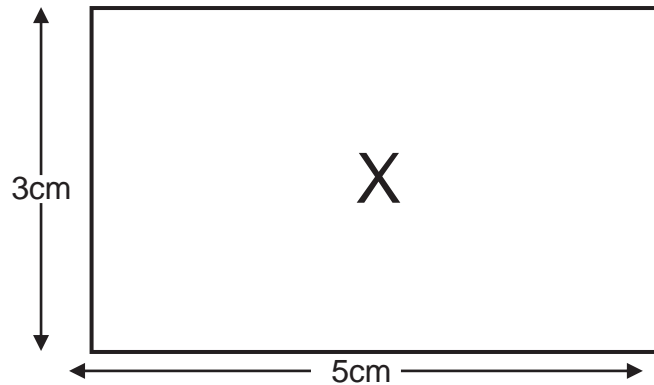
STEP 3
Answer in km

$$= 2,4\ \text{km}$$

AREA

FORMULA: AREA = Length x Breadth

Calculate the area of Blok X.



STEP 1
Calculate length of block
in cm

$$\begin{aligned} \text{Length} &= \frac{5 \text{ cm} \times 50\,000}{100\,000} \\ &= 2,5 \text{ km} \end{aligned}$$

STEP 2
Calculate breadth of block
in cm

$$\begin{aligned} \text{Breadth} &= \frac{3 \text{ cm} \times 50\,000}{100\,000} \\ &= 1,5 \text{ km} \end{aligned}$$

STEP 3
Place in Formula

$$\begin{aligned} \text{Area} &= l \times b \\ &= 2,5 \times 1,5 \end{aligned}$$

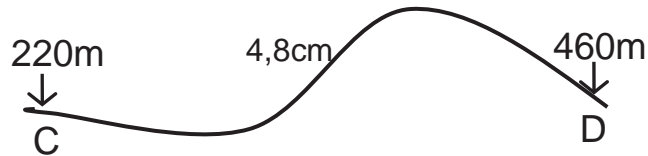
STEP 4
Answer in km²

$$= 3,75 \text{ km}^2$$

GRADIENT

FORMULA: Gradient = $\frac{VI \text{ (Difference in height)}}{HE \text{ (Horizontal distance)}}$

Calculate the gradient from C to D.



STEP 1
Calculate difference in height

$$460 - 340 = 120\text{m}$$

STEP 2
Calculate distance

$$\text{Distance} = \frac{\text{Map distance} \times \text{Scale}}{100\ 000}$$

$$= \frac{4,8 \times 50\ 000}{100\ 000}$$

$$= 2,4 \text{ km}$$

STEP 2
Convert to **METERS**

$$= 2\ 400\text{m}$$

STEP 4
Place in formula and **SIMPLIFY**

$$\text{Gradient} = \frac{\text{Difference in height (VI)}}{\text{Distance (HE)}}$$

$$= \frac{120\text{m}}{2\ 400\text{m}}$$

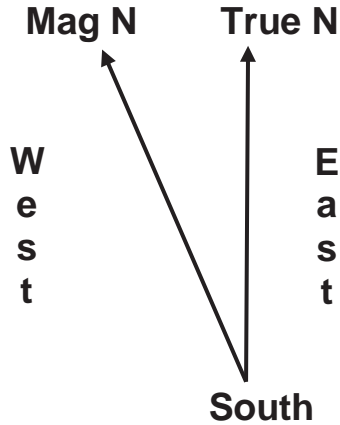
$$= \frac{1}{20}$$

STEP 5
Answer as a ratio

$$= 1:20$$

MAGNETIC DECLINATION AND MAGNETIC BEARING

Magnetic declination is the difference between true North and magnetic North (on compass).



- NB The following when you work with Magnetic Declination**
1. What is the mean mag. declination (in degrees & minutes?)
 2. In which direction is the magnetic declination?
 3. In which year is the magnetic declination given?
 4. What is the mean annual change?
 5. In what direction is the average yearly change?
 6. For what year must the mag. declination be calculated?

Mean magnetic declination $23^{\circ} 53'$ West of true north (Julie 2002).
 Mean annual change $6'$ Westwards.

Calculate magnetic declination for 2009.

STEP 1
 Calculate difference in years

$$2009 - 2002 = 7 \text{ years}$$

STEP 2
 Calculate total change

$$6' \times 7 \text{ years} = 42' \text{ West}$$

STEP 3
 Add or subtract from magnetic declination

$$\begin{array}{r} 23^{\circ} 53' + \\ \underline{42'} \\ 23^{\circ} 95' \end{array}$$

STEP 3 NB: FOR SOUTH AFRICA
 If the change is towards the **WEST**, it is **ADDED**.
 If the change is towards the **EAST**, it is **SUBTRACTED**

STEP 4
 Remember: Minutes cannot be more than **60** !

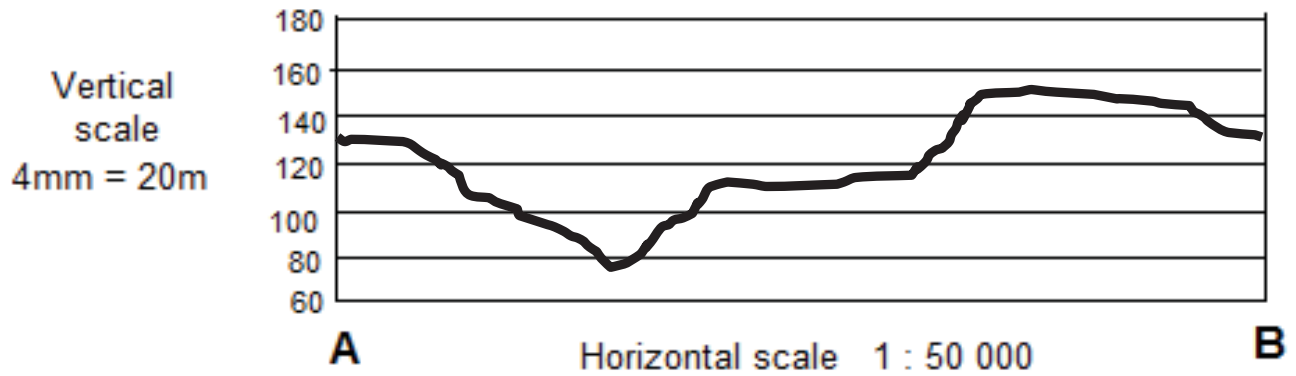
$$= 24^{\circ} 35' \text{ West}$$

MAGNETIC BEARING
 Magnetic bearing is calculated by simply adding the bearing

5 VERTICAL EXAGGERATION

FORMULA: $VE = \frac{\text{VERTICALE SCALE}}{\text{HORIZONTAL SCALE}}$

Calculate the vertical exaggeration of the following



STEP 1
Convert VS to ratio scale

$$4\text{mm} = 20\text{m}$$

$$4\text{mm} = 20\,000\text{mm} \quad (\text{same units})$$

$$4 : 20\,000$$

$$1 : 5\,000$$

STAP 2
Place in formula

$$VE = \frac{\text{VERTICAL SCALE}}{\text{HORIZONTAL SCALE}}$$

$$= \frac{1}{5\,000} \div \frac{1}{50\,000}$$

$$= \frac{1}{5\,000} \times \frac{50\,000}{1}$$

$$= 10 \text{ Times}$$