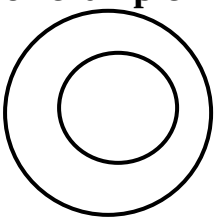
S.3 GEOGRAPHY NOTES

MAP WORK

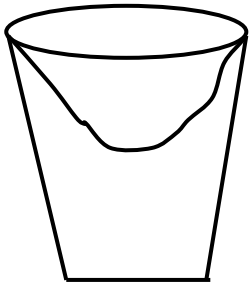
A map is a representation of all or part of the earth's surface (both physical and human features) drawn on a flat surface

The difference between a map and a picture is that, a map is a drawing of an object as seen from above, while a picture is a drawing of an object as seen from aside.

For example

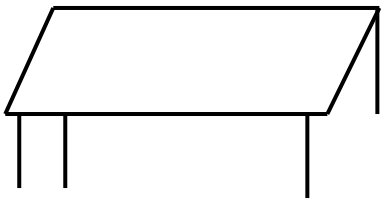


A map of a bucket



A picture of a bucket

A map of a table



A picture of a table

Map reading refers to identification and interpretation of physical and human geographical features on the map extracts.

Examples of the physical geographical features studied include the following:

- Climate
- Drainage (water bodies like lakes, rivers, swamps etc)
- Vegetation (both natural and artificial/planted)
- Relief (landforms like mountains, hills, valleys cliffs etc)
- Soils
- Natural occurrences like landslides, earthquakes, drought, floods, weathering etc.

The human geographical features studied include:

- Arable farming/crop cultivation
- Livestock rearing
- Settlement
- Transport and communication
- Forestry
- Trades / commerce
- Industrialisation/manufacturing industries
- Mining/quarrying
- Population
- Tourism
- Fishing

NB: Students should be able to draw a map of their classroom and as well the map of their school showing the main features like ;

- Classroom blocks
- Administration block
- Library
- Roads
- Trees

  Etc

Types of maps

Maps are classified according to their content like relief maps, population maps, vegetation maps, political maps, economic maps etc or according to their nature such as wall maps, globe, atlas maps, survey maps etc.

Elements of a good map

Elements or qualities of a good map are also referred to as map conventions. They are summarised information about the map that help to explain what the map is about. They include:

- Title
- Scale
- Key
- Direction
- Frame

1. **A title**

   This is the heading of a map . It is usually written at the top of the map. It gives a summary of what the map is all about and thereby making the person reading the map to know the kind of information to expect i.e it may mention the name of the place drawn and what the map shows/ contains e.g. " Population distribution in Africa", " physical features of Uganda", "climate of East Africa" etc.

2. **A scale**

   This is a constant relationship of actual length on the ground to much shorter lengths representing them on the map. That is , they are ratios between length on the map and on the earth's surface. It tells us or the person using the map how much of the earth's surface is represented on the map.

   Ways of expressing scales

   Map scales are usually expressed in the following ways:

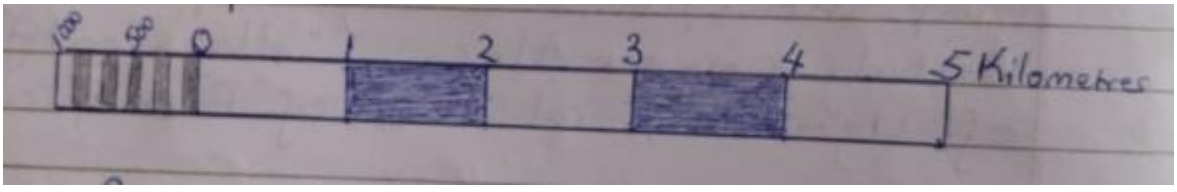
   (i) As a statement i.e only words are used in describing a statement scale e.g One centimetre represents one kilometre

   (ii) As a representative fraction (RF) i.e $\frac{\text{distance on the map}}{\text{distance on the ground}}$ e.g $\frac{1}{1000}$

   This means that one unit on the map represents one thousand similar units on the ground . Usually the R.F scales are written as ratios, thus 1:1000

   (iii) By a drawn linear scale . A linear scale is often given as a rod of conventional thickness divided into equal lengths according to the statement of the scale e.g. Two centimetres to one kilometre

   For example



   Conversion of scales

   It's useful to know how to convert one scale to another since scales are given in more than one way. For example

   (i) Converting from representative fraction (R.F) to a statement scale, like $\frac{1}{10,000}$

The procedure is as follows

- Convert the denomination of the R.F into kilometres by dividing the denominator of the R.F by 100,000(the actual number of centimetres in a kilometre)

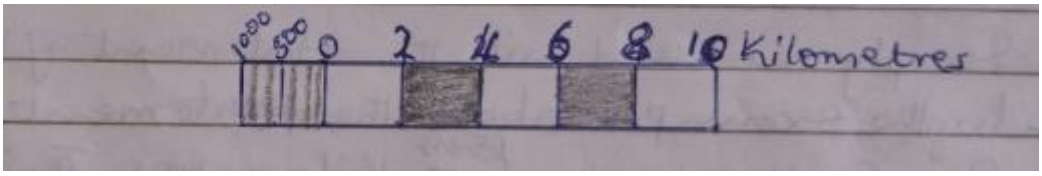
  i.e. $\frac{10,000}{100,000} =$ 0.1km

- Therefore, the scale by statement would be; one centimetre to 0.1 kilometres. This means that 1cm on the map represents a distance of 0.1km on the ground.

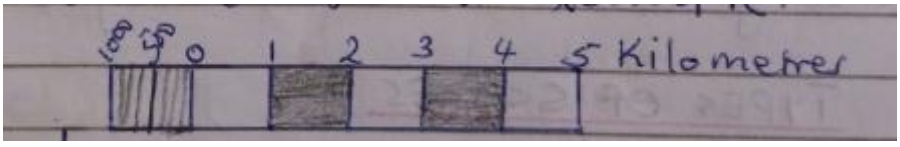
(ii). Converting from a statement scale to a representative scale (R.F) . For example, the statement is given as ; one centimetre to one kilometre. The procedure is as follows:

- First convert the kilometres into centimetres by multiplying the kilometres by 100,000(Actual number of centimetres in one kilometre)
- i.e 1 x 100,000 = 100,000 centimetres.
- So the statement scale is; one centimetre to 100,000 centimetres
- Now as R.F, this becomes $\frac{1}{100,000}$ or 1:100,000.

(iii.) Converting from a statement scale to a linear scale. For example one centimetre to two kilometres. The procedure is; draw a linear scale with each centimetre representing two kilometres as illustrated below.



(iv) Converting from a linear scale to representative fraction (R.F). For example.

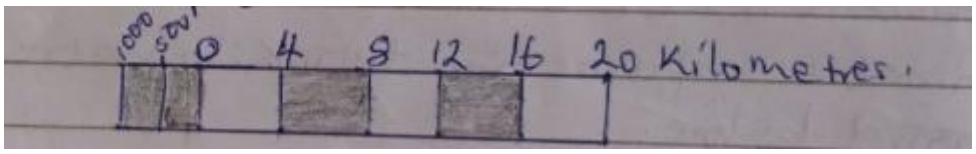


In the above example, the distance represented by one centimetre on the map is one kilometre on the ground. To express this as a statement scale would be one centimetre to one kilometre.

- Following the same procedure as in (2) above, the statement scale would be ; one centimetre to one hundred thousand centimetres.
- Therefore the R.F is $\frac{1}{100,000}$ or 1: 100,000

- Converting from the R.F scale to linear scale. For example, R.F is given as $\frac{1}{200,000}$
- First convert the given R.F to a statement scale by dividing the denominator of the R.F by 100,000(Actual number of centimetres in a kilometre.
- Thus the statement is one centimetre to two kilometres
- Draw a linear scale with each centimetre representing two kilometres as in (3) above.

(vi.) Converting a linear scale to a statement scale. For example:



- Simply read and write the statement of the scale
- In the example above the statement is one centimetre to four kilometres; this means that 1cm on the map represents a distance of 4 (four) km on the ground.

TYPES OF SCALES

The following terms are used to refer to the scales of maps; small scales, medium scales and large scales

(a). Small scales

In small scale maps, the actual ground distances are greatly reduced and this is shown by the R.F ratio having large numbers (denominators) e.g. 1;1,000,000; 1:500,000; 1:250,000. These scales can be used to produce maps showing very large areas e.g. the world and continents. The main disadvantage of small scale maps is that they do not show much details.

(b). Medium scales

They have the R.F denominators that are not as large as those of the small scale maps. For example 1:125,000, 1:100,000; 1:50,000. The medium scale maps show more details than the small scale maps.

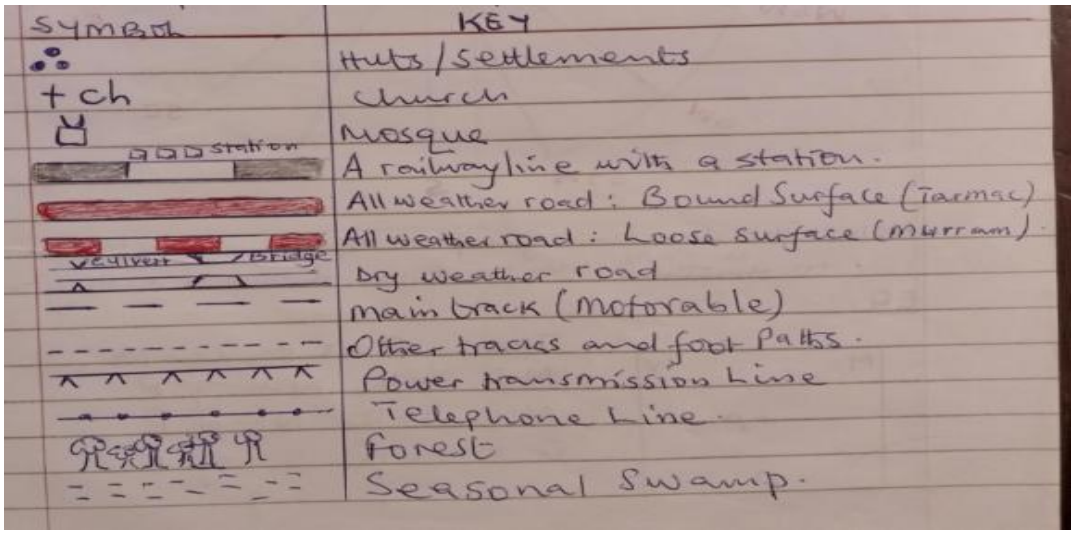
(c). Large scale maps

In large scales, there are small R.F denominators which show that; the degree of reduction of actual ground distance is much less than the small and medium scales e.g. 1:25,000; 1:10,000. Large scales are used to produce

maps of small areas with greater details and this makes them useful for tourist purposes

3. Symbols and Keys (Conventional signs)

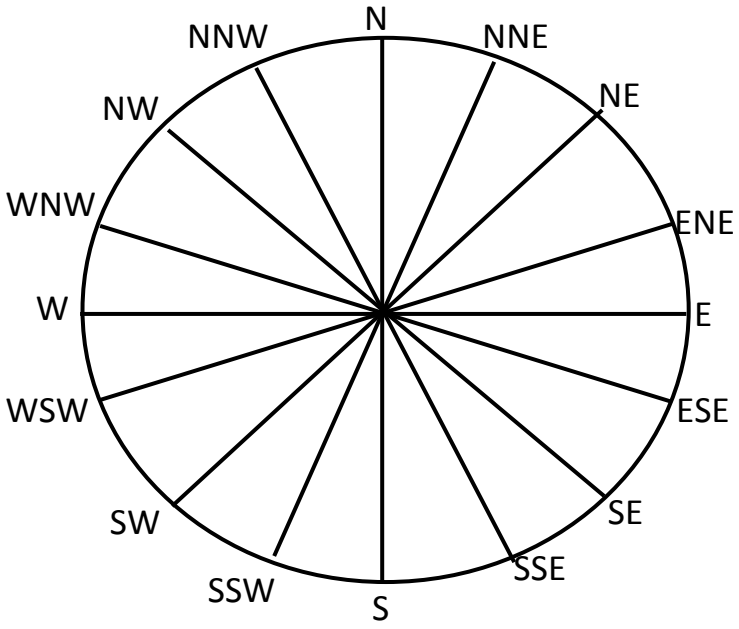
A symbol is a simple sign used on a map to represent a feature on the ground. The meaning of a symbol is explained in a key that accompanies the map. For example:



4. Direction

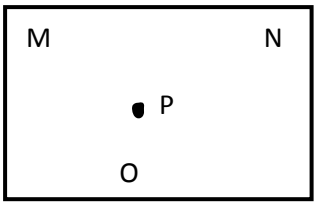
Direction refers to a position of a place in relation to another on a map or on the ground. Direction helps people to locate positions of places and other objects found on the map. On the earth surface, or on the map, one direction must be chosen from which the positions of others can be described and measured. For this purpose, the North is usually used. The instrument used for measuring direction is called a compass.

THE MAIN POINTS OF THE COMPASS



Note: The direction of a place is given in relation to a particular point on the map or on the ground.

E.g .



Taking P as the centre:
M is to the NW of P
N is to the NE of P
O is to the S of P

BEARING

This is the direction or exact position of a place or object in relation to another. It is measured in degrees. For example in the illustration below; measure the bearing of Z from Y. The procedure is as follow

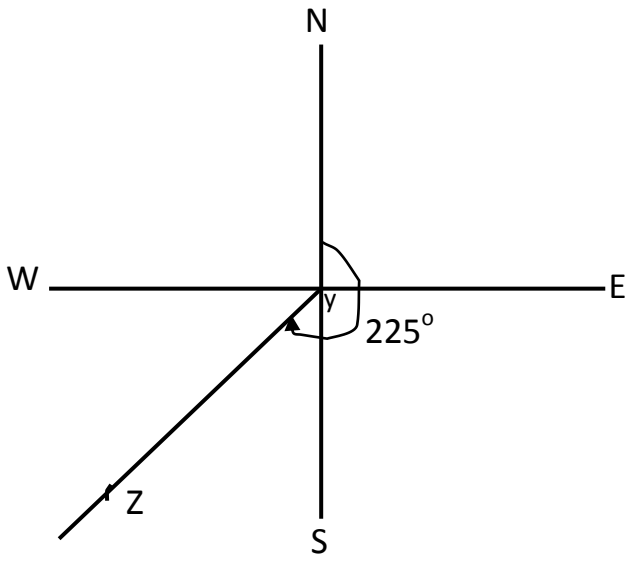
(i). Identify and mark the two points in this example, they are Z and Y

(ii). Draw a pencil line joining the two points. If the distance is very short, extend this line.

(iii). Through the point from which the bearing is required (in this example it is Y), draw a pencil line running from North to South and one at right angles to it running East to West (Draw a compass at a point stated " from" in the question).

(iv). Using these lines to set your protractor and placing the centre on point Y, measure in a clockwise direction, the angle from North to the line running to your second point(in this example, point Z)

(v). State the bearing in degrees of three figures e.g. 060^o, 110^o, 005^o etc in the example below, it is 225^o.



LATITUDES AND LONGITUDES:

Latitudes and longitudes are the most geographical method of stating positions of features. They are angular measurements from the centre of the earth, a reason they are measured in degrees (^{o}) minutes (') and seconds(")

Latitudes

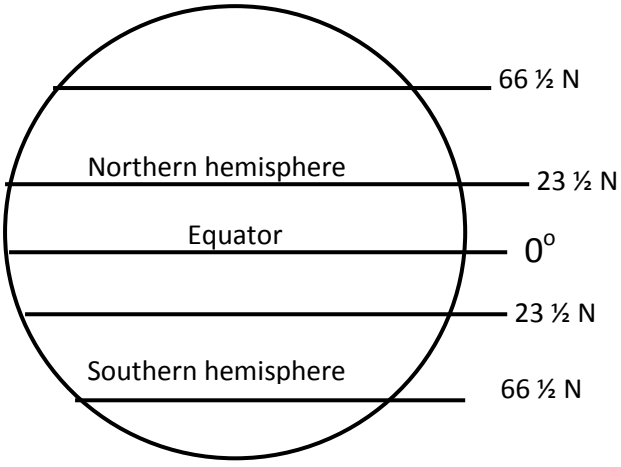
These are imaginary lines on a map running from East to West. They help in locating places or objects. The measurement of latitudes is in degrees (^{o}), minutes (') and seconds"( ) . The latitude angles are measured North and South wards from 0^o to 90^o

The middle and the longest latitude is called the equator which is 0^o latitude. The equator divides the earth into two halves called hemispheres i.e the Northern hemisphere and the Southern hemisphere.

Other lines drawn parallel to equator are called parallels of latitudes. The parallels of latitude join all points which are the same degrees from the equator e.g. 60^oN means that every point on that parallel is 60^o north of equator, and 30^o S means that every point on that parallel is 30^o south of equator.

So as well as saying that a place is so many kilometres south of the equator e.g 3,300km; we can equally say it is 30^o south of equator and its position is written as 30^oS

Major lines of latitude



Longitudes

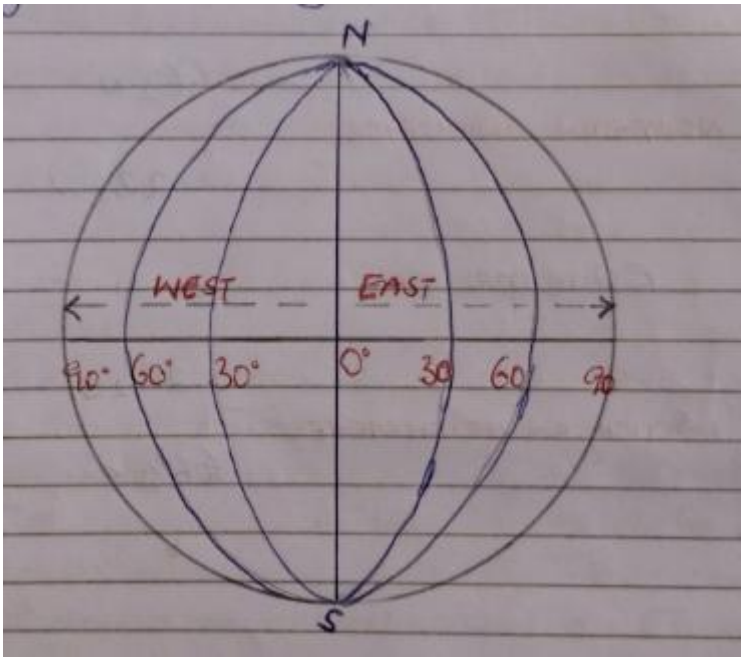
Lines passing through the North pole and the south pole are also drawn on maps. These are called lines of longitude or meridians. They are angular measurements East wards and Westwards from the centre of the Earth and

measured in degrees (^{o}), minutes ( ) and seconds ( ). The longitude angles are measured east and westwards from 0^o to 180^o.

The middle meridian from which other meridians are measured is called the prime meridian and is 0^o

Most countries use the Greenwich meridian as the Prime meridian. So as well as saying that a place is so many kilometres e.g. 1700km west of the Greenwich meridian, we can as well say it's 70^o west of it and is written as 70^oW

Diagram showing latitudes



Note:

(i). In locating places using latitudes and longitudes, N or S must be added to the latitude and E or W to the longitude.

(ii). The latitude should always be given first, then the longitude follows.

(iii). Points of inter section between latitudes and longitudes are called co-ordinates.

(iv). It is good practice to write the minutes' ( ) and second" ( ) in two figure groups. Thus $17^o\ 04'\ 09''$, than $17\ 4'\ 9''$.

GRID REFERENCE SYSTEM

This is a system used for locating or describing position of places/objects on a map. It consists of a network of vertical and horizontal lines making perfect square which can be sub-divided further. Each line is given a number.

Numbering

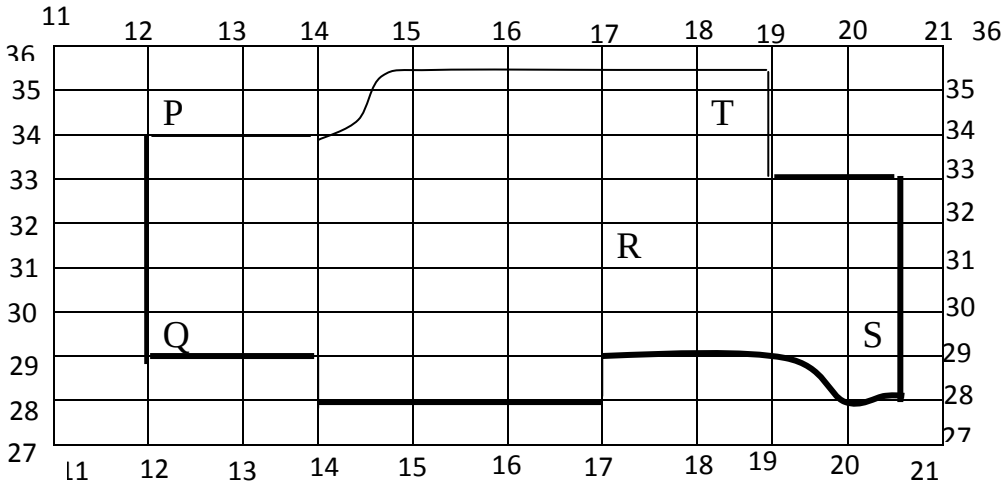
It starts from the south west corner called the Grid Origin. Vertical lines are numbered progressing eastwards and are called **EASTINGS** , while the horizontal lines are numbered progressing northwards and are referred to as **NORTHINGS**

Reading:

The eastings are read first and the northings follow when locating a place / object on a map.

Note that Grid lines are imaginary lines printed on the map and have no reality on the ground.

A GRID MAP



The grid references for the points P, Q, R, S and T as shown below:

P - 120340

Q – 125305

R – 169319

S – 205290

T – 185341

The difference between one grid line and the next is called the Grid interval, and it is in most cases 1.

MEASURING DISTANCES ON A MAP

(a). <u>Straight distance</u>

Given a straight line between two points e.g. A and B, follow the steps below to determine its length

(i). Identify and mark the two points

(ii). Join the two points using a ruler and a sharp pencil
(iii.) Stretch the dividers to cover this distance
(iv). Transfer the dividers to the linear scale without extending or squeezing them
(v). Place one pin of the dividers against the nearest whole number that their span covers and the other pin on the secondary section(sub-divided section) for fractions, then read off the distance.

NB: A piece of thread or a piece of paper with a straight age can also be used following the same procedure above.

Measuring meandering distances (e.g. Roads, railway lines, Rivers, Boundaries etc)

Procedure A

(i). Identify and mark the two points between which the distance is to be measured.
(ii). Divide the required distance by light pencil marks into parts that are nearly straight
(iii). Measure each of the sections with a dividers and a ruler
(iv). Add the lengths of the sections
(v). Transfer the total length to the linear scale and read off the distance.

Procedure B

This method involves using a piece of thread as follows:

(i). Identify and mark the two points between which the distance is to be measured
(ii). Place one end of the thread on to one of the two points
(iii). Tress the thread along the required distance up to the second point
(iv). Then transfer the thread length to the linear scale
(v) Finally, read off the distance in km/miles.

Procedure C

A piece of paper with a straight edge and a pencil can also be used for the same purpose

(i) Twist the paper along the distance marking off the straight parts on the distance up to the final point
(ii) Transfer the marked part on the paper onto the linear scale and read off the distance

MEASURING AREAS

1. Calculating area of a regular feature

If the feature appears in form of a regular shape, for example a triangle , rectangle, square or even a circle, then apply a mathematical formula of the shape concerned i.e ½ bh, LxW , S^2 and πr^2 respectively.

2. Calculating area of irregular features

If the feature is irregular in shape, there are a number of methods but the most popular and convenient for students is the Grid square method as explained below.

(i). write the scale (or bear in mind) that one grid square on the map represents $1km^2$ on the ground.

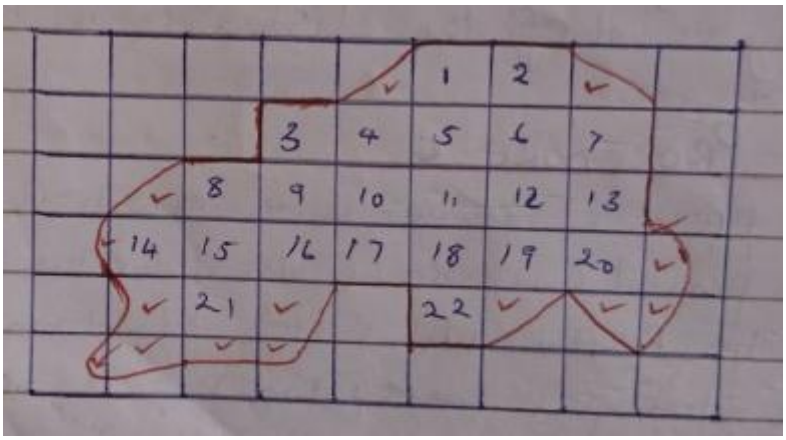
(ii). count and record the number of full squares

(iii). count and record the number of half square and divide by 2

(iv). Add the total of full squares and the average of half squares and multiply the sum by $1km^2$

(v). The result gives the area of the feature in question, in square kilometres.

ILLUSTRATION



1 grid square represents $1km^2$

Full squares = 22

Half squares = $\frac{15}{2}$

= 7.5

Total = 22 + 7.5 = 29.5 squares

Area = (29.5 x 1) km^2

= 29.5 km^2

Contours

Contours are imaginary lines drawn on maps connecting places of equal heights above sea level. Normally contours are numbered following a fixed (constant) interval on a given map. The difference in altitude (interval) between two successive contours is called the VERTICAL INTERNVAL (V.I)

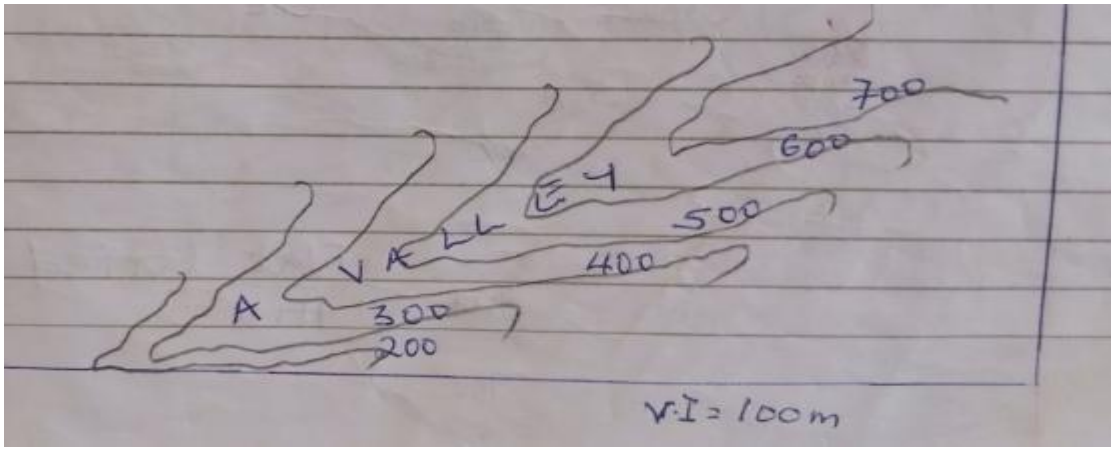
NB: Contour lines can never meet/cross one another because no one point can be at two different heights above sea level at the same time.

IDENTIFICATION/INTERPRETATION OF RELIEF FEATURES (LANDFORMS) ON A SURVEY MAP

On any survey map, the arrangement of contours can be used in identification of various land forms. This is possible because different contour patterns depict different landforms. For example:

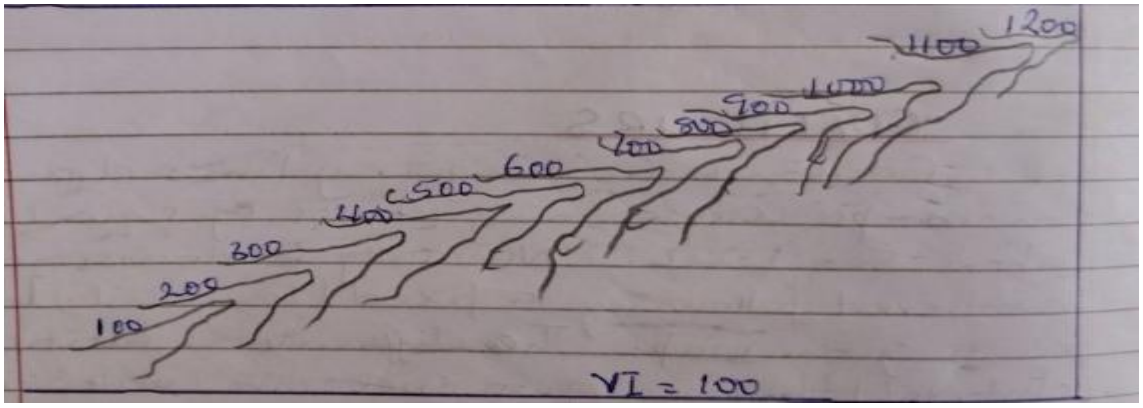
A valley

This is an elongated narrow depression lying between two higher tracts of land. It can be between two spurs.



A Gorge

This is a narrow valley with steep banks on either side.

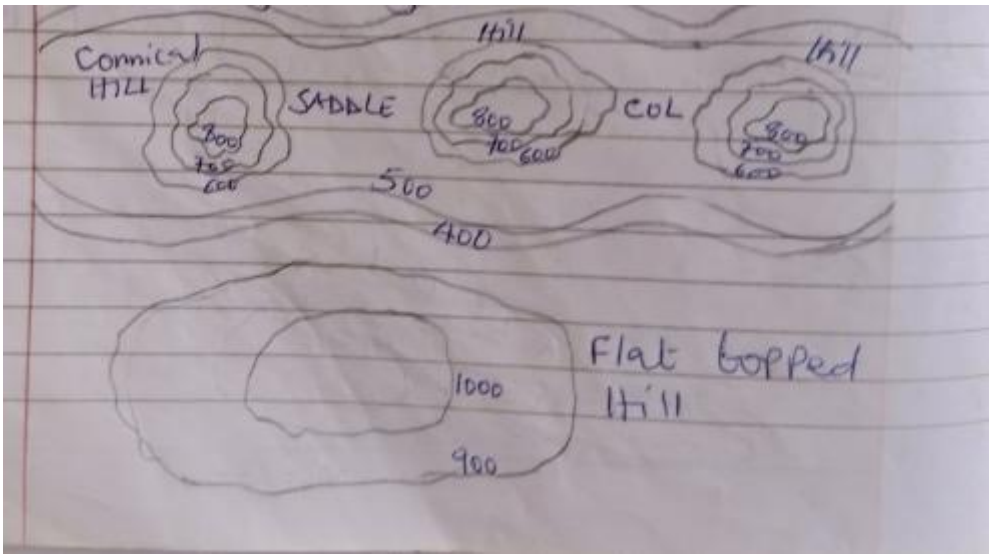


A hill

Is a landform rising above the surrounding land. There are conical and flat topped hills conical hills are hills that have circular contour lines that run up to their tops. The flat topped hills are hills that have got circular contour lines which are wide at the tops.

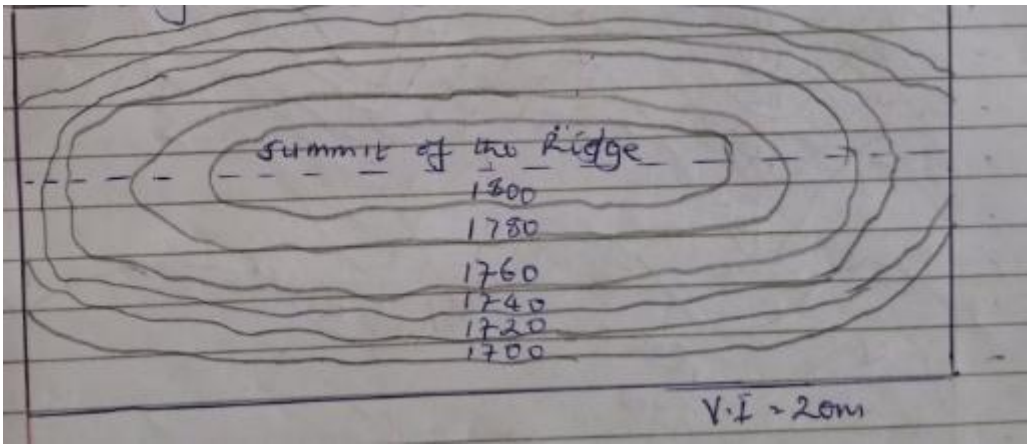
A saddle / col

A saddle/col is a low piece of land that connects the peaks of hills or mountains. The difference between the two is that a saddle is generally wider than a col.



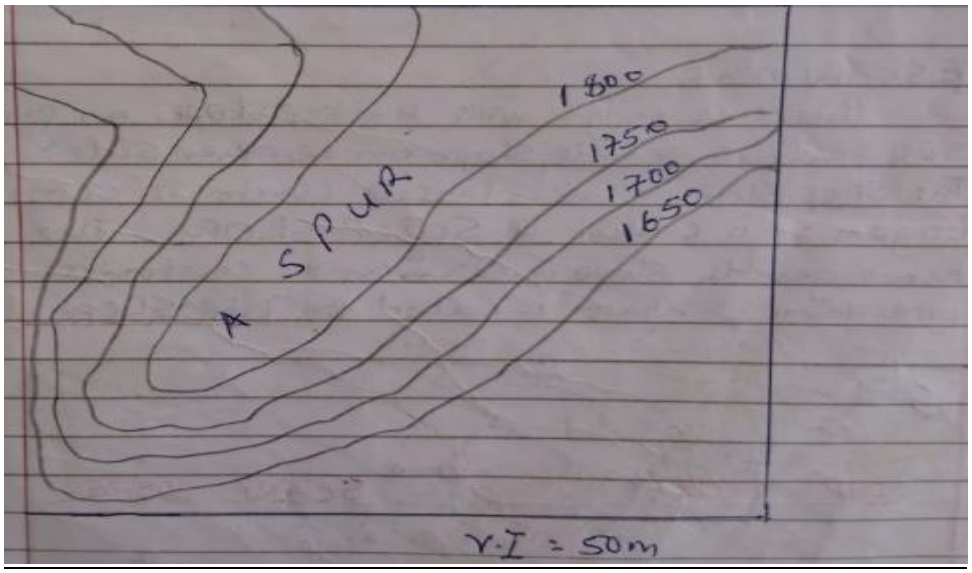
A ridge

This is a long and narrow hill with steep sides falling down on both sides. It may be formed as a result of a line of hills. A ridge is indicated by contour values which increase towards the top of the ridge.



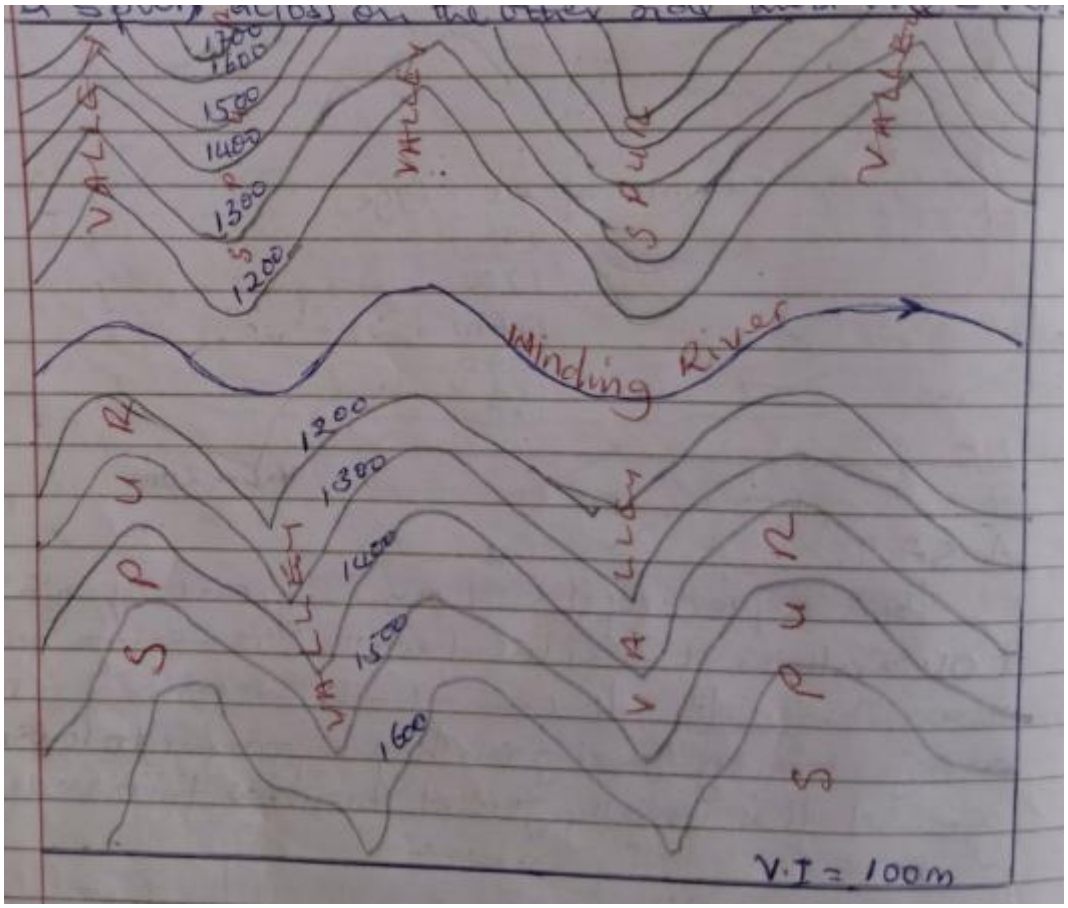
A spur

It is a piece of land running out of a hill/ mountain towards the lower land with its length greater than its width. It can also be described as a projection of land from higher ground to lower ground. It is usually found between two valleys.



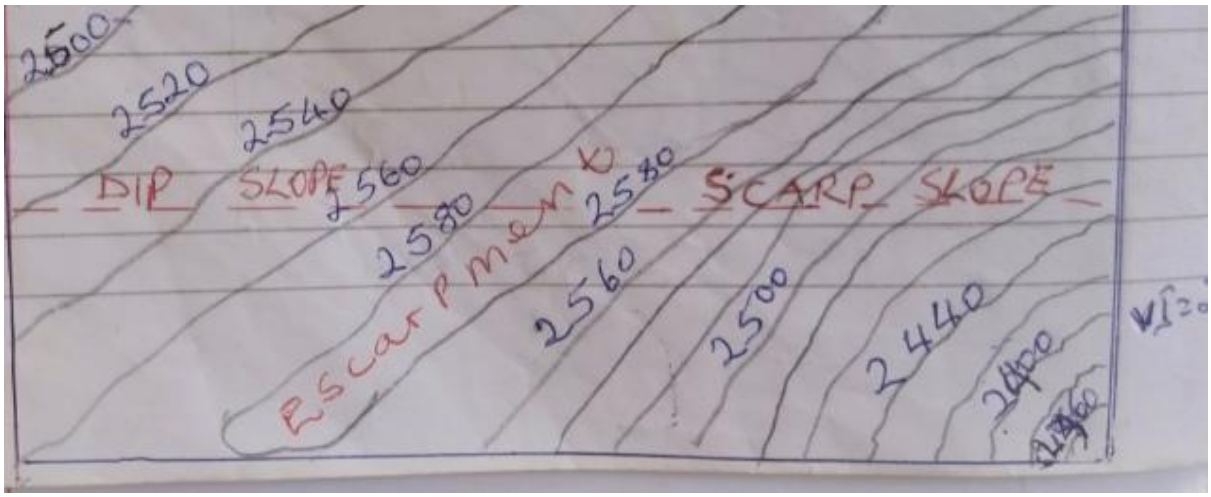
Interlocking spurs

These are spurs which form walls of a curving river valley. The spurs are themselves separated by the river valley. Therefore, a valley between spurs on one side of the main river valley, faces a spur across on the other side and vice-versa.



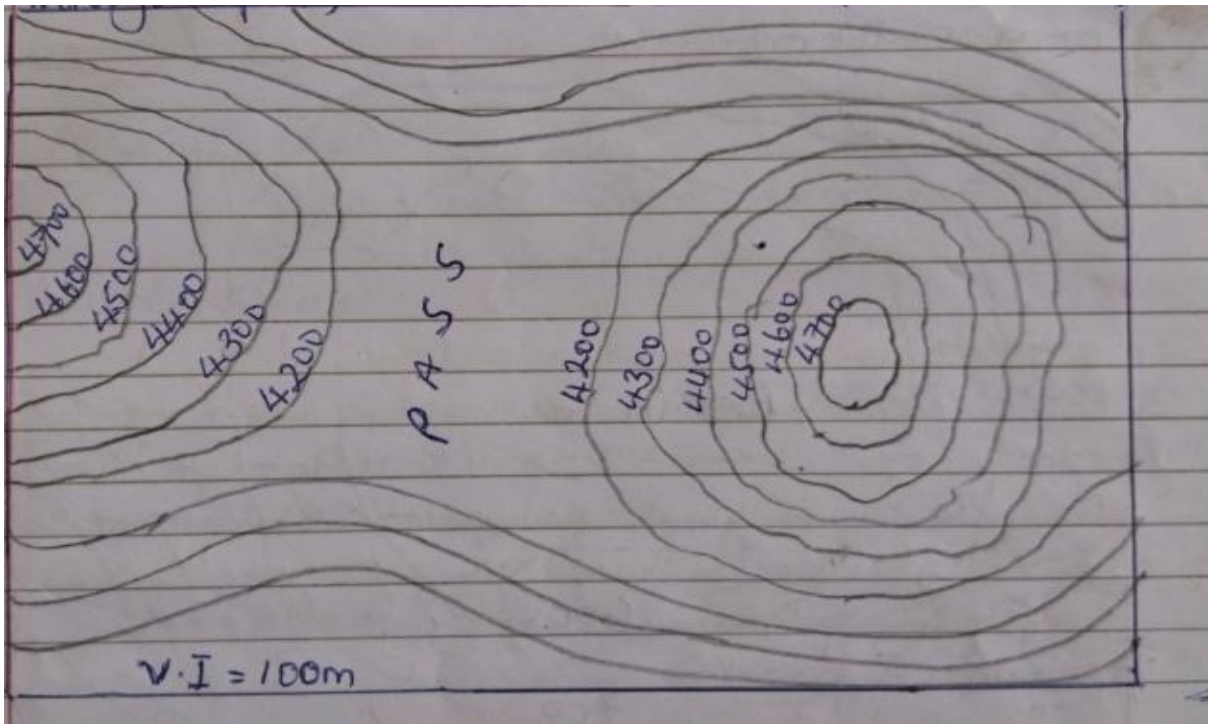
Escarpment

This is a ridge with a steep slope on one side and a gentle slope on the other side. The steep slope which has its contours close together is called a scarp slope. The more gentle slope in which the contours are farther apart is called the Dip slope.



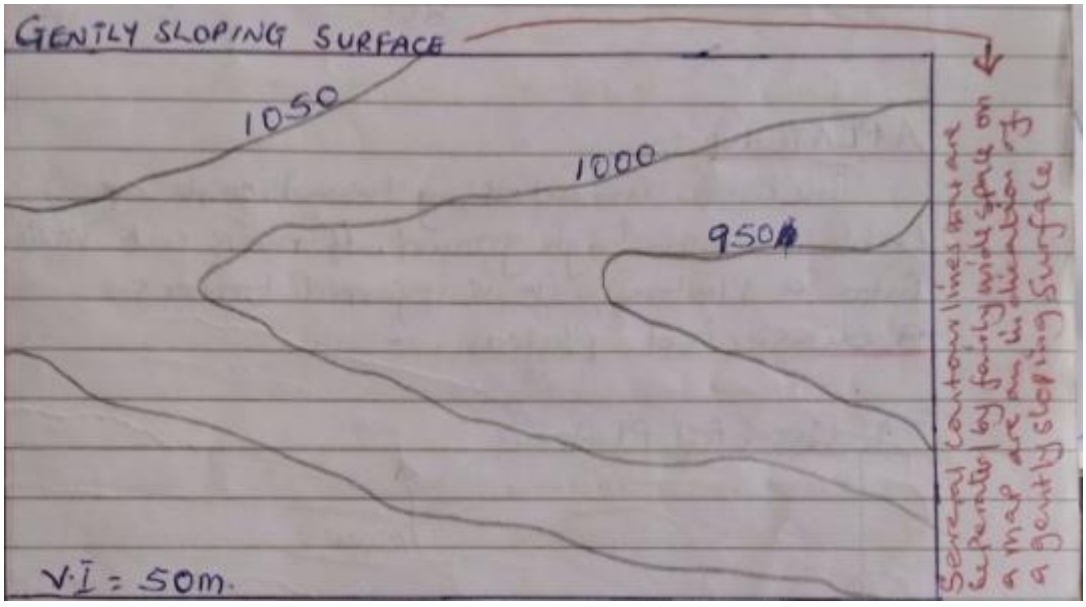
A pass

This is a way through a mountain range. On either side of a pass is very much higher land. Through a pass, a route can be constructed.



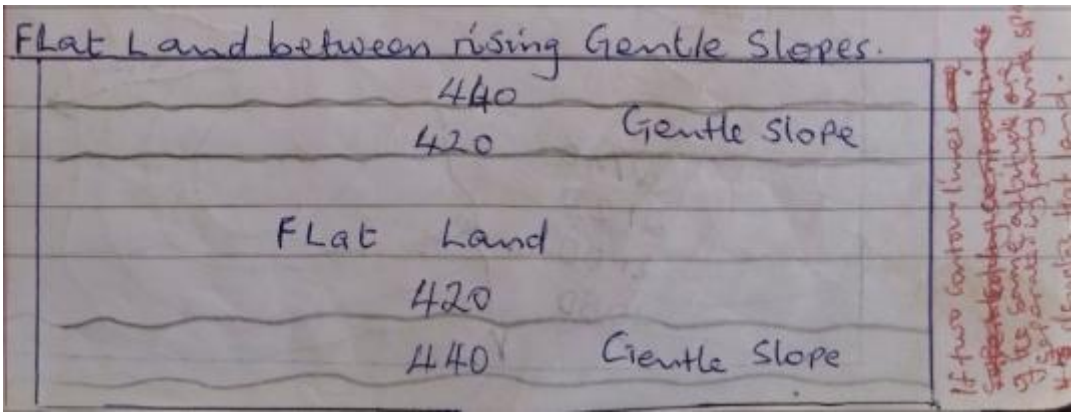
Gently sloping surface

Several contour lines that are separated by fairly wide spaces on a map are an indication of a gently sloping surface.



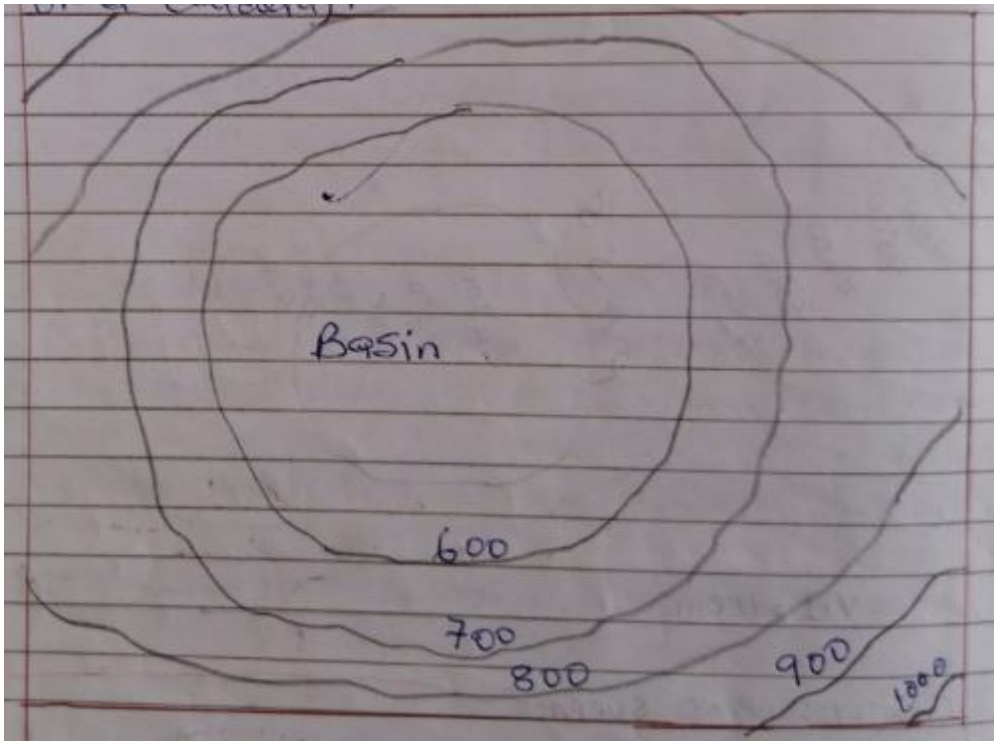
Flat land between rising gentle slopes

This is denoted by two contour lines of the same altitude separated by fairly wide space.



<u>A basin / depression</u>

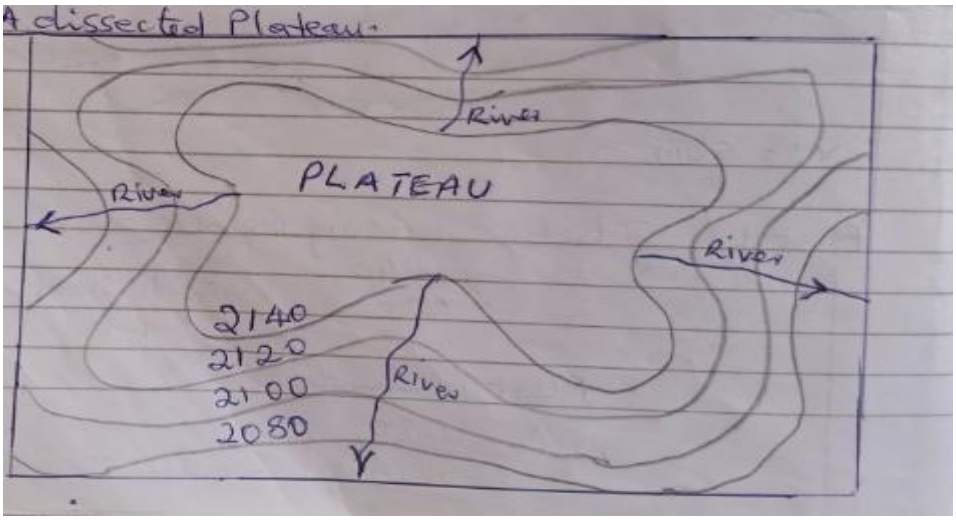
Where contour lines form a "closed pattern" but the lowest value is in the middle, indicates a basin or a depression (The basin may be a crater or a caldera)



A plateau

This is an undulating landscape or table land on high ground. If rivers cut valleys into a plateau, it is referred to as a dissected plateau.

A dissected plateau



A source

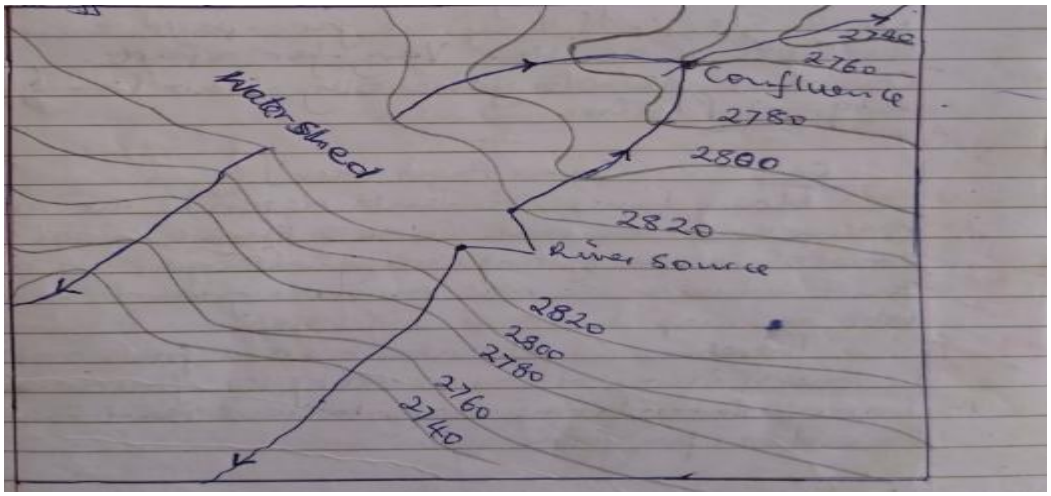
This is a place where a river rises. It is determined by the position of the highest contours along a river course as rivers normally flow from higher lands to lower lands.

A confluence

This is a point where two rivers meet.

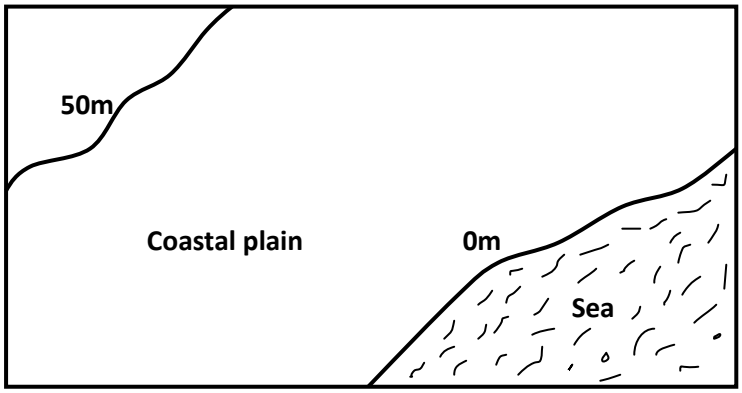
A watershed

A watershed also known as a divide is a high piece of land which separates rivers flowing in opposite directions and towards different basins.



A plain (for example coastal plain)

A coastal plain is land along the coast which is extremely gently sloping .
For example:



NB: When contours are close to each other, it denotes that the place is hilly and in case of a slope, it is steep. If they are far apart, then the slope is gentle. Very far apart contours denote generally flat land e.g a plain.

Caution (Seven pages back)

Many times, students describe the map rather than the real earth's surface and so lose the purpose of map reading. Geographers are concerned with the real physical ground and not the map on a piece of paper.
Therefore, in describing areas from maps learners should take note of the following:

1. Do not describe the map, instead read the landscape from it
2. Do not refer to part of the map, refer to ' part of the earth's surface represented' for example do not write, ' the northern part of the map, but write ' the northern part of Soroti'.
3. Do not write, "the road that goes off the map, but write "the road that goes to… i.e mention the place name.
4. Do not write, "the contours are close together" write, " the slope is steep". It is equally wrong to write, "the slope is steep because the contours are close together". Obviously contours do not cause the steepness of the slopes.
5. In map reading, focus on the features that are present, do not waste time on those that are not (unless there is a requirement to examine potentials)
6. Write and put the descriptions into the third person. For example, write, "as altitude increases", not "as you go up"! who is going up?

METHODS OF SHOWING ALTITUDE ON A MAP

There are various ways of showing the altitude (height above sea level) on a survey map. They include;

- Contour lines
- Spot heights
- Trigono metrical stations
- Layer tinting or layer colouring
- Form lines
- Hachuring

Of the above the first four(04) are more relevant to map reading in secondary schools and therefore deserve detailed handling as below.

1. Contour lines

   These are imaginary lines drawn on maps joining place of the same altitude/height above sea level. Contours do not meet as no one point can be at two different heights above sea level at the same time. They can only be extremely close to each other as in the case of very steep slopes (cliffs) .

2. Spot heights

   Spot heights are dots marked on a map with figures showing particular heights indicated at the side of the dot e.g. 2400. If the area has been surveyed in feet, this means 2,400ft.

3. Trigonometrical stations

   A trigonometrical station is a triangle with the altitude (height above sea level) written besides it.

   There are three types of trigonometrical stations as explained below

   (i). Trigonometrical station, primary- The triangle stands in its normal position e.g.  2500

   (ii). Trigonometrical station; secondary- The triangle is inverted e.g

    3400

(iii) Trigonometrical station; others – A circle with a dot at the centre e.g.

 1500

4. Layer tinting/layer colouring. Different colours are used to represent different heights of places e.g. brown for highlands and green for low lands. Colours must be accompanied with a key to explain the heights they represent.

Types of settlement (settlement patters)

1. Nucleated /clustered/grouped settlement.
   In this patter, settlements are close together/concentrated settlement i.e people live in groups , or clusters. For example in oases, settlement camps and mining centres

2. Dispersed / scattered settlement
   In this pattern, settlements are far apart from each other. It is common in rural areas and reflects a low population

3. Linear settlement
   In this case, people establish their settlements along or at the sides of transport routes like roads and railway lines

4. Grid/planned settlement
   This is when settlements are arranged (established) in a regular layout/organised manner. Examples are found in mining centres, irrigation schemes, plantation farms and towns.

IDENTIFICATION OF ECONOMIC ACTIVITIES FROM A SURVEY MAP

Different economic activities are practised by man to feed himself and earn a living. These activities vary from one place to another depending on the relevant factors

When identifying economic activities on a map, evidence must be given (a factor for the existence of the said activity) and the location of the said factor on the map).

The following hints will help one to identify them on a survey map.

(i). Arable farming:
Ginneries and cotton buying posts(CBPs) for cotton, hulleries for coffee, jaggery works for sugar cane, tea estates for tea, plantations etc. At times estates are marked and named.

(ii). Pastoralism
Grassland areas with scattered clusters of dwellings and perhaps dams, boreholes , water holes are likely settings. Also lookout for named veterinary installations such as water pumps, tanks, cattle and quarantine camps, spray races, cattle dips and creameries among others

(iii). Fishing

The presence of a water body like a lake, river or swamp etc, fishing village(settlements along the coast), fish traps ( ), fish ponds, fish landing sites, fish processing plants etc. Note that not all water bodies are fishing grounds as some of them are too saline or too polluted to sustain fish life.

(iv). Forestry

Forest reserves, forest colleges/schools, forest department, are possible indicators.

(v). Lumbering:

Look out for sawmills and minor roads ending in forested areas.

(vi). Mining and quarrying

Mining centre, a quarry, smeltery etc sometimes the following symbols are used on maps (mine);  (quarry)

(vii.). Manufacturing/ industrialisation

Factory, hullery, jaggery, ginnery etc . To identify a factory, a factory pictogram of a smoking chimney is used. At times ,factory installations are named on the map.

(viii). Trade/ commerce

Trading centres, markets, towns , ports and railway station. Roads and railways for effective transportation of goods and traders.

(ix). Tourism

National parks, game reserves, zoos, rest houses, sanctuaries, game departments, Museums, antiquities (forts, tombs and other historical sites) and well developed transport routes are indicators of tourism.

(x). Transport and communication

Roads of all types, railway lines, telephone lines, airfields, airports, post offices, ferry lines and communication masts.

(xi). Hunting – Hunting area

RELATIONSHIPS BETWEEN GEOGRAPHICAL PHENOMENA

Areas shown on maps display various aspects. These aspects are physical and human in nature.

The physical aspects include;

- Relief
- Vegetation
- Drainage
- Soils

- Climate

The human aspects include;

Settlements, transport features, agricultural establishments, forestry, industry, fishing activities etc.

Relationships exist between these various aspects and these relationship are divided into three :

- Physical physical
- Physical human
- Human human

A) Examples of physical – physical relationships

(i). **Relationships between relief and drainage**

- Lakes occupy basins/ depressions
- Rivers originate from water sheds/high lands
- On steep slopes, rivers tend to have short straight courses
- Gently sloping areas tend to have dendrite drainage pattern
- Areas around lake basins tend to have centripetal drainage pattern
- Rather flat areas have trellis drainage pattern
- Rivers tend to meander in flood plains (low lying areas)
- Dissected plateaus tend to develop in high ground areas which are relatively flat where rivers cut valleys through the area.
- Swamps tend to occupy broad river valleys/flood plains

2). Relationships between relief and vegetation

- gentle slopes have woodlands and scattered trees as well as forests
- highland areas have bamboo forests
- steep slopes tend to have short grass
- gentle slopes have tall grass
- low lying areas are characterised by swamp vegetation and riverine forests

3). **Relationship between drainage and vegetation**

- swamps, river banks and lake shores tend to have papyrus vegetation
- coastal waters grow mangrove vegetation
- river banks tend to have riverine forests
- dry areas tend to have scanty vegetation.

B). Examples of physical- human relationships :

1. Relationships between relief and settlement

- gentle slopes have concentrated settlement
- steep slopes are avoided for settlement

- broad valleys with fertile soils are densely settled
- plateaus/low lands are evenly settled
- very low lands are avoided for settlements because they are prone to flooding
- conical hill tops are avoided for settlements
- flat topped hills are densely settled.

2. Relationship between relief and transport/communications

- highland areas have roads that tend to meander
- Many roads and communication lines tend to follow gentles slopes
- roads pass through cols, saddles and passes
- flat areas tend to have straight roads
- ferries/steamers cross lake basins and broad river valleys
- foot paths are common on relatively flat areas
- hill tops have communication masts
- bridges are constructed across gorges(deep narrow valleys)
- Airfield /airports are constructed on flat areas/ lowlands
- roads/railways cross river valleys using culverts or bridges
- steep slopes are avoided by roads and used for foot paths

3). Relationships between drainage and settlement.

- well drained areas are heavily settled because they promote agriculture
- poorly drained areas are less settled because they are prone to flooding and water borne diseases.
- areas around the lake shores are well settled because of the fertile alluvial soils that promote agriculture
- Areas around oases in deserts are heavily settled because of proximity/accessibility of fresh water.

4). Relationship between drainage and transport/communication

- roads and railway lines cross rivers and swamps where they are narrow
- areas without rivers and swamps have rather straight roads
- roads /railway lines cross river and swamps by use of culverts/bridges
- roads tend to avoid crossing rivers because construction of bridges is expensive/costly

5). Relationship between vegetation and settlement

- grassland areas are heavily settled because they are easy to clear.
- forested areas are avoided for settlement
- forest margins are sparsely settled.

C). Examples of Human –Human Relationships:

1. Relationships between settlement and transport/communication
   - settlements are concentrated along major roads

- heavily settled areas have well developed transport network
- nucleated settlement pattern is found around road junctions, ports, landing sites etc
- sparsely settled areas have poorly developed transport routes

2. Tourism and transport
3. Trade and transport

DRAWING SKETCH MAPS

A sketch map is a fair representation of the actual map. It is not drawn to scale as is the case with a real topographical map.

There are two major types of sketch maps namely;

(i). simple or ordinary sketch maps

(ii) re-sized sketch maps

When drawing sketch maps, it's important to take note of the following:

- It should have the qualities of a good map i.e title, key, direction and frame
- It must follow the shape of a given map extract i.e if the map extract is a square, then the sketch map should also have a square shape, if it is rectangular, then the sketch map must also be rectangular.
- A sketch map must have the features marked and named accurately
- The sketch map must be neat.

1. Simple / ordinary sketch maps

In drawing a simple sketch map, one may or may not measure the sides of the given topographical map.

A skilled map user simply looks at the dimensions of the map i.e length and width and recognises which of the two is longer and which one is shorter.

The outline of the sketch is then drawn following the relative lengths of the sides

The features asked for in the question are then drawn in the outline in their correct positions as they are in the map extract and then labelled.

2. Re-sized sketch maps

There are two types of re-sized sketch maps namely:

- Reduced sketch maps
- Enlarged sketch maps

(a). Reduction of maps

A reduced sketch map will be smaller than the original map from which it is derived by the number of times it will have been reduced. For

example if the map is to be reduced three times, the following steps should be taken:

(i). Using a ruler, measure the length of the original topographical map (or part of the map area for which reduction is required). Divide the obtained measurement by the number of times the map is to be reduced (in this example by 3)

(ii). Similarly , measure the width of the same map or area. Again divide the obtained measurement by the number of times the map is to be reduced (in this example by 3)

(iii). using the measurements obtained in (i) and (ii) above draw the outline of the required sketch map.

(iv). The required features are then marked and named on the outline in their correct positions.

(b). Enlargement of parts of maps

An enlarged part of the map will be bigger than the original part of the map from which it was enlarged.

Note that it is not practical to enlarge the entire area shown on the common East Africa 1:50,000 topographical map extracts. These are usually large sheets that are already larger than the students ordinary A_4 papers. What is practical therefore is to enlarge part of the topographical map.

For example it may be decided that part of the map be enlarged two times, the following steps should be taken.

(i). Using a ruler, measure the length of part of the map for which enlargement is required. Multiply the obtained measurement by the number of times the part of the map is to be enlarged (in this example by 2)

(ii). Similarly measure the width of the same area. Again multiply the obtained measurement by the number of times the part of the map is to be enlarged (in this example, by 2)

(iii). using the measurements obtained in (i) and (ii) above, draw the outline of the required sketch map.

(iv). The required physical and human features are then drawn on the outline in their correct positions as they are in the original map.

CALCULATING THE SCALE OF A RE-SIZED SKETCH MAP

A - A scale for a reduced sketch map

A scale for the reduced sketch map should as expected be smaller than that for the original topographical map.

(Remember, when two scales are compared, the smaller scale is that with a bigger denominator).

This is obtained by dividing the original scale by the number of times the map was reduced (in this example, 3 times)

Using the example described above for map reduction, the procedure will be as follows:

Scale for original topographical map - $\frac{1}{50,000}$

Number of times the map is reduced – 3

Therefore the new scale is: $\frac{1}{50,000} \div 3$

$$= \frac{1}{50,000} \times \frac{1}{3}$$

$$= \frac{1}{150,000} \quad \text{or} \quad 1: 150,000$$

B - Scale for an enlarged part of the map

The scale for the enlarged sketch map should as expected be large than that for the original topographical map. (Again remember, when two scales are compared, the larger scale is that with a smaller, denominator). This is obtained by multiplying the scale of the original topographical map by the number of times the map is enlarged.

Using the example described above for map enlargement, the procedure is as follows:

Scale for original topographical map: $\frac{1}{50,000}$

Number of times the map is enlarged: 2

Therefore the new scale is : $\frac{1}{50,000} \times 2$

$$= \frac{2}{50,000}$$

$$= \frac{1}{25,000} \quad \text{or} \quad 1:25,000$$

DRAWING A RELIEF CROSS SECTION

A relief cross section is a drawing showing the nature of relief between two points along a straight line. This shows changes in both elevation and relief of the area in question.

Apart from the features required in the question, a cross section should as well have:

1. A title indicating the name of the area, start and end points of the cross section and the features required.
2. Correct horizontal distance stated in the correct units e.g. Kilometres, depending on the units used on the extract
3. Horizontal scale which is the same as that of the given map extract e.g 1:50,000
4. Vertical scale
5. The two grid reference points indicted in the question should be written at the base line, one at its beginning and the other at the end

Procedure for drawing a relief cross section

1. Identify and mark with dots, the two points between which the cross section is to be drawn
2. Join the two points using a ruler and a pencil
3. Place a straight edge paper on the pencil line joining the two points and mark on the paper the beginning and end points, every point where a contour line crosses the pencil line and as well the features asked for in the question (Every contour mark should bear the altitude of that contour)
4. Transfer the marked straight edge paper onto the answer booklet / sheet
5. Mark the beginning and end points on the answer booklet
6. Draw a horizontal line (base line) joining the two points (this line should be the same distance as on the map extract)
7. Draw vertical lines on both ends of the baseline and indicate the scale on both sides and the units of measure, for example height in feet or height in metres basing on a given map extract
8. Indicate the grid reference numbers at the beginning and end points of the baseline
9. Use the information on the straight edge paper to mark the co-ordinates/points of the cross section
10. Join the points marked by free hand pencil line (not with a ruler), making sure that you use an upward curve for hill tops and a downward curve for valley bottoms.
11. Mark the features asked for in the question and name them horizontally above the cross section

12. Uniformly shade the area below the cross section curve to portray a realistic impression of the relief surface above the line/curve.

CALCULATIONS ON A CROSS SECTION

1. Calculating the aptitude of a cross section.

Aptitude refers to the difference between the highest point and the lowest point of the cross section drawn.

It is the highest point minus the lowest point

Or highest point - lowest point

For instance, given highest point = 3750m

Lowest point = 3500m

Amplitude = highest point – lowest point

= (3750 – 3500)m

= 250m

2. Calculating the vertical exaggeration of a cross section

The term vertical exaggeration refers to the number of times the vertical scale is bigger than the horizontal scale or the number of times the vertical scale has been magnified in comparison to the horizontal scale. It is therefore expressed as a number without units.

Vertical exaggeration is calculated as follows;

$$\text{Vertical exaggeration (VE)} = \frac{\text{vertical scale (VS)}}{\text{horizontal scale(HS)}}$$

For example, given that;

Vertical scale is 1cm represents 250m

Horizontal scale is 1:50,000

Note that before the division, the units of measure must be the same. Thus the 250m should be changed to centimetres and written in a ratio form.

Thus (250m x 100cm) = 25,000cm

:. Vertical scale = 1cm : 25,000cm

= 1: 25,000.

$$\text{Vertical exaggeration (VE)} = \frac{\text{Vertical scale (VS)}}{\text{Horizontal scale(HS)}}$$

$$= \frac{1}{25{,}000} \div \frac{1}{50{,}000}$$

$$= \frac{1}{25{,}000} \times \frac{50{,}000}{1}$$

$$= \frac{50{,}000}{25{,}000}$$

$$= 2$$

3. The horizontal equivalent (HE) of a cross section

The Horizontal equivalent (HE) refers to the distance between the two points between which the cross section is drawn. It is sometimes called Horizontal distance. It is a distance measured on a map but converted into actual ground distance. It forms the baseline of the cross section.

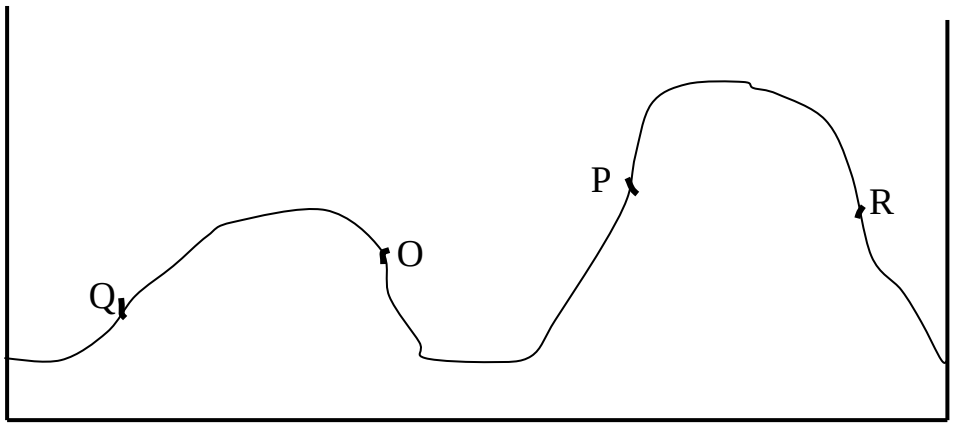
DETERMINING INTERVISIBILITY

It is useful to be able to say whether one place is visible from another. Sometimes this can be decided by an examination of the contours using the following steps

1. Find the two points on the map, note their heights, join them with a thin pencil line
2. Observe carefully the heights joining the two points e.g. O and P. If the heights in between them are not higher than those of O and P, then the two points are intervisible and vice versa.

   If in doubt, or if the question requires you to support your answer with a diagram, then you have to construct a cross section of the land scape between O and P. This is the line of sight and if it passes clear of any land between the two points, then they are each visible from each other. If there is land higher than the two points in between them, then they are invisible from each other.

   For example, the diagram (cross section) below shows that while O and P are intervisible Q and R are not.



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