Solutions for all Social Sciences

Grade 9

Learner’s Book

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MACMILLAN
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What this topic is about

- How we show the shape of the land on a map
- How we show height on a map
- Different ways of representing the land from above
- Contour lines and patterns
- Map scales
- How to interpret maps, orthophoto maps and aerial photos

Look at the picture

1. Is this a view of the land from the top or the side?
2. How do the objects look different from the way we normally see them?
3. Name some ways the land is used in this area.
4. Who do you think might find this view of the land useful?
1. Concept of contour lines

Contour lines are lines that map makers draw on maps to show the height and shape of the land. Contour lines are marked on large scale maps called topographic maps. The lines help you to ‘read’ what the land looks like. The drawings that follow show how contour lines can show the height and the shape of a hill.

This is what the same hill looks like from above.

This is what a hill looks like from the side.
The shape of the hill is not that easy to see when we view it from above, as we do on a map. Map makers draw contour lines to make the shape of the hill easier to see on a map. Contour lines show the shape and height of the hill clearly. Each contour line joins points that are the same height above sea level, for example there will be a contour line showing 140 m.

Contour lines represent the shape and height of the land on maps.

This is a model of a hill. Each contour line is shown as a separate piece of cardboard.
Map makers get information about the height of places from aerial photographs, satellites and people who survey the ground. This information is fed into a computer and processed with software to help the cartographer draw contour lines from the raw data.

The drawing on the right shows some raw data about the height of land in an area. The numbers represent height above sea level. The 300 m contour line is already marked on the drawing.

**Classroom activity 1.1**

Work on your own and complete questions 1 and 2. Then work with a partner for question 3.

1. Look at the diagram above showing raw data. Make a copy of the area shown in the drawing and draw contour lines at 50 m intervals. The following contour lines must appear on your drawing:
   - 100 m, 150 m, 200 m, 250 m, 300 m, 350 m, 400 m, 450 m, 500 m.
   - Use the numbers on the map to help you estimate the position of the contour lines.
   - The diagram to the right shows how to estimate the position of contour lines between spot heights.

2. Examine the diagram you have drawn.
   - What landform does your pattern of contours represent?
   - How do you know this?

3. Check your partner’s map. Did your partner draw each of the contour lines in the correct place?
2. Steep and gentle slopes

Some hills have steep slopes. Some hills have gentle slopes. If you climb a steep slope, you go upward without walking very far along the ground. When you walk up a gentle slope, you need to walk a much longer horizontal distance to reach the same height. The contour lines on a map show how steep the slope is. Contour lines that are close together show a steep slope. Contour lines that are far apart show a gentle slope.

Contour lines show the gradient of steep and gentle slopes.

Contour lines that are close together show a steep slope. Contour lines that are far apart indicate a gentle slope.

Gradient

Gradient describes the steepness of a slope. Gradient is the angle of the slope compared to a level surface. A slope will have a steep gradient if there is a big height difference between two places that are close together (therefore contour lines will appear close together on a map). The slope will be gentle if the places are far apart and the height difference is not great (therefore contour lines will be far apart on a map). The following drawing shows gradient.

Ladder A shows a steep gradient.
The ladder reaches a height of 4.5 m against the wall.
The horizontal distance from the wall is 2 m.

Ladder B shows a gentle gradient.
This ladder reaches 1.5 m against the wall.
The horizontal distance from the wall is 7 m.

Gradient is the angle of a slope compared to a vertical and horizontal surface.
3. River valleys and spurs

All rivers flow downhill. A river valley is the land a river flows over. Spurs are narrow pieces of land that extend into or between river valleys.

The contour lines for the spur make the shape of a ‘U’. The bottom of the U is the lowest contour line. The contour lines for the river valley make the shape of an upside-down ‘V’.

The contour lines for the spur make the shape of a ‘U’. The bottom of the U is the lowest contour line. The contour lines for the river valley make the shape of an upside-down ‘V’.

Classroom activity 1.2

Work with a partner. Study the diagram on this page and answer these questions.

1. Identify the height of the land at point A.
2. Describe the gradient of land on this slope.
3. Estimate the height of the land at point B.
4. Describe the gradient of the land in this river valley.
5. If you walk from X to Y, will you be walking uphill or downhill?
6. Rewrite the following sentences so that they are true.
   a) Contour lines that are close together indicate a gentle gradient.
   b) If you walk up a slope that has a steep gradient you will walk a short distance to gain a lot of height.
   c) Contour lines that are far apart indicate a steep slope.
Unit 2  1:10 000 Orthophoto maps

1. Vertical aerial photographs

In Grade 8 you learnt that vertical aerial photographs are photographs taken from aeroplanes that show the land from directly above. The camera attached to the bottom of the aeroplane is kept level and parallel with the ground. Cartographers use information from vertical aerial photographs to help them create and update maps.

- **distortion**: change from the normal or true shape of an object; when something does not appear as it actually is

The scale of a vertical aerial photograph is only accurate near the centre of the photograph. The scale becomes less accurate further away from the centre of the photograph. Objects show greater distortion with increased distance from the centre of the image.

An aerial photograph of part of Port Shepstone in KwaZulu-Natal
2. Orthophoto images made from aerial photographs

Cartographers use computers to make orthophoto images from vertical aerial photographs. An orthophoto image corrects the distortion in a vertical aerial photograph to make the scale accurate for the whole image. These images are called rectified images. The scale is adjusted to 1:10 000 for all parts of the image.

Cartographers make orthophoto maps by adding information to orthophoto images. So an orthophoto map has features of an aerial photograph as well as a map. An orthophoto map has contour lines, spot heights, roads and place names.

Homework activity

Examine the aerial photograph of Port Shepstone on page 7 and the orthophoto map above.

1. Find the highest point on the aerial photograph and the highest point on the orthophoto map. How do you know these are the highest points?

2. Identify the following features on each image: a gentle slope, a river valley, a settlement.

3. What extra information is provided on the orthophoto map to help you identify a gentle slope, a river valley and a settlement?

4. Explain why the orthophoto map would be more useful than the vertical aerial photograph to a surfer who wants to work out the distance from her friend’s house to the beach.
3. How height is shown on orthophoto maps

Orthophoto maps show height in two ways: spot heights and contour lines.

- Spot heights are places where the exact height of the land is known. This height is marked on a map with a dot. The height in metres is printed next to the dot.
- Contour lines are always marked at 5 m intervals on orthophoto maps. The numbers on the contour lines give the height of the land above sea level.

An orthophoto map of an area near Umzimkulu in the Eastern Cape
4. Contour lines on orthophoto maps – identifying features

Contour lines help you to identify features on orthophoto maps. Some orthophoto maps are printed in black and white.

Here are some useful tips to help you interpret orthophoto maps:
- Contour lines show river valleys, hills, spurs and many other natural features.
- Water usually appears to be black.
- Human-made features appear as straight lines.
- Natural features such as rivers have irregular shapes.
- Vegetation appears as dots.

![Contour Patterns](image)

KEY
A = A river with steep sides
B = A spur and river
C = Gently sloping land
D = A hill

Contour patterns showing common features on orthophoto maps

Classroom activity 1.3

Work with a partner. Study the orthophoto map of Umzimkulu on page 9 and the contour line patterns on this page. Answer these questions.

1. Identify and name the highest spot height on the orthophoto map.
2. Find an area where there is a river on the orthophoto map. Point it out to your partner.
3. Find an area on the orthophoto map where there is a gentle slope. Draw five contours for this area. Give the height of each contour.
4. Find an area on the orthophoto map where the slope is steep. Draw five contours for this area. Give the height of each contour.
5. a) Look for reasons on the orthophoto map to explain why the buildings are located where they are.
   b) Identify other ways that the land is used in the area.
Unit 3  1:50 000 Topographic maps

1. Read map symbols to identify features on topographic maps

Topographic maps are printed in colour. They use different signs and symbols to represent objects on the ground. Some symbols are lines; some are points with letters next to them; other areas are shaded in colour. The key that follows is a list of most of the signs and symbols you will see on 1:50 000 topographic maps.

<table>
<thead>
<tr>
<th>REFERENCE</th>
<th>VERKLARING</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Freeway; National Route</td>
<td>Nasionale Deurn; Nasionale Roete</td>
</tr>
<tr>
<td>Arterial Route</td>
<td>Hoofverkeersroete</td>
</tr>
<tr>
<td>Main Road</td>
<td>Hoofpad</td>
</tr>
<tr>
<td>Secondary Road; Bench Mark</td>
<td>Sekondêre Pad; Hoogtemerk</td>
</tr>
<tr>
<td>Other Road; Bridge</td>
<td>Andor Pad; Brug</td>
</tr>
<tr>
<td>Track and Hiking Trail</td>
<td>Dowwe Pad en Voetsilaanpad</td>
</tr>
<tr>
<td>Railway; Station or Siding</td>
<td>Spoorweg; Stasie of Slyn</td>
</tr>
<tr>
<td>Other Railway; Tunnel</td>
<td>Andor Spoorweg; Tunnel</td>
</tr>
<tr>
<td>Embankment; Cutting</td>
<td>Opvulling; Deurgrowing</td>
</tr>
<tr>
<td>Power Line</td>
<td>Krylaag</td>
</tr>
<tr>
<td>Built-up Area (High, Low Density)</td>
<td>Geboue Gebied (Hoë, Lae Dightheid)</td>
</tr>
<tr>
<td>Buildings; Ruin</td>
<td>Geboue; Murskie</td>
</tr>
<tr>
<td>Post Office; Police Station; Store</td>
<td>Postkantoor; Polisiesetstasie; Winkel</td>
</tr>
<tr>
<td>Place of Worship; School; Hotel</td>
<td>Ploek van Aanbidden; Skool; Hotel</td>
</tr>
<tr>
<td>Fence; Wall</td>
<td>Draadheining; Muur</td>
</tr>
<tr>
<td>Windpump; Monument</td>
<td>Windpomp; Monument</td>
</tr>
<tr>
<td>Communication Tower</td>
<td>Kommunikasietoring</td>
</tr>
<tr>
<td>Mine Dump; Excavation</td>
<td>Myntloof; Uitgraving</td>
</tr>
<tr>
<td>Trigonometrical Station; Marine Beacon</td>
<td>Peilbaken; Soo vaarbanken</td>
</tr>
<tr>
<td>Lighthouse and Marine Light</td>
<td>Vuurtr jon en Sevaartlig</td>
</tr>
<tr>
<td>Cemetery; Grave</td>
<td>Begraafplaas; Graf</td>
</tr>
<tr>
<td>International Boundary and Beacon</td>
<td>Internasionale Grens en Bakens</td>
</tr>
<tr>
<td>Provincial Boundary</td>
<td>Provinciale Grens</td>
</tr>
<tr>
<td>Protected Area</td>
<td>Bewarings Gebied</td>
</tr>
<tr>
<td>Perennial River</td>
<td>Standhoudende Rivier</td>
</tr>
<tr>
<td>Perennial Water</td>
<td>Standhoudende Water</td>
</tr>
<tr>
<td>Non-perennial River</td>
<td>Nie-standhoudende Rivier</td>
</tr>
<tr>
<td>Non-perennial Water</td>
<td>Nie-standhoudende Water</td>
</tr>
<tr>
<td>Dry Water Course</td>
<td>Droë Loop</td>
</tr>
<tr>
<td>Dry Pan</td>
<td>Droë Pyn</td>
</tr>
<tr>
<td>Marsh and Vlei</td>
<td>Moer en Vlei</td>
</tr>
<tr>
<td>Pipeline (above ground)</td>
<td>Pyl en (bo die grond)</td>
</tr>
<tr>
<td>Water Tower; Reservoir; Water Point</td>
<td>Watertoring; Reservoir; Waterpunt</td>
</tr>
<tr>
<td>Coastal Rocks</td>
<td>Kuslynbrace</td>
</tr>
<tr>
<td>Prominent Rock Outcrop</td>
<td>Prominente Klipbank</td>
</tr>
<tr>
<td>Erosion; Sand</td>
<td>Erosie; Sand</td>
</tr>
<tr>
<td>Woodland</td>
<td>Bebeoste Gebied</td>
</tr>
<tr>
<td>Cultivated Land</td>
<td>Bewerkte Land</td>
</tr>
<tr>
<td>Orchard or Vineyard</td>
<td>Boerd van Wingerd</td>
</tr>
<tr>
<td>Recreation Ground</td>
<td>Ontspanningssteele</td>
</tr>
<tr>
<td>Row of trees</td>
<td>Rye Bome</td>
</tr>
</tbody>
</table>

Important symbols used on 1:50 000 topographic maps
Natural features on topographic maps

Some of the symbols in the reference for the 1:50 000 topographic map on page 11 show natural features. Natural features are things that are part of nature, such as rivers, mountains, natural forests and beaches.

Examples of constructed features and the symbols used on 1:50 000 topographic maps

Classroom activity 1.4

Work on your own and complete these tasks.

1. Draw the symbols to show the following natural features:
   a) a non-perennial river
   b) a marsh or vlei
   c) an area where there is sand or erosion.

2. Most of the symbols in the reference for the 1:50 000 topographic map on page 11 show constructed features.
   a) Why do you think this is the case?
   b) Explain the difference between a natural and a constructed feature.

3. Draw and colour the symbols for the following constructed features:
   a) arterial road
   b) secondary road
   c) police station
   d) cemetery.
Features on topographic maps

In this section you will examine a topographic map and apply the knowledge and skills you have learnt so far in this topic.

Classroom activity 1.5

Work on your own and answer these questions. Refer to the symbols on page 11 to help you.

1. What type of road crosses the map from north to south?

2. Name one natural water feature on the map that is not a perennial river.

3. Locate the following features on the map: cultivated land, rows of trees, a track or hiking trail, an embankment.

4. Name two other constructed features and two natural features on the map.
2. Height clues on topographic maps

There are four ways height is shown on topographic maps. Some of these ways are the same as the way height is shown on orthophoto maps.

Spot heights
Spot heights show the exact height of a place and are shown with a dot marked on the map.

Contour lines
Contour lines join places that are at the same height above sea level. Contour lines are printed as brown lines on topographic maps. The contour interval is 20 m on 1:50 000 topographic maps. A darker brown contour line shows contour lines that are 100 m apart. Not all the contour lines are numbered.

Trigonometric beacons
South Africa’s land surface is covered by a system of trigonometric beacons. Each beacon is used to survey the land for national maps and government records. Trigonometric, or trig beacons, are physical points on the land for which the exact height has been calculated and printed on a marker attached to the ground. Trig beacons are shown on 1:50 000 topographic maps as a little triangle. Each trig beacon has a number next to the triangle written in italics. This number shows where the trig beacon fits into the national surveying system. The exact height of the land is shown below the triangle.

Bench marks
Bench marks are similar to trig beacons and spot heights. They are points for which the exact height is known. Bench marks usually appear on topographic maps as a number next to a road, with a small arrow showing the exact location. Bench marks and trig beacons usually show decimal points in their height, for example, 1133.1.

Classroom activity 1.6

Work with a partner. Examine the map of Ixopo on page 13 to find the following height clues:

1. Identify the spot height between Flaxton and Linford in the north-west part of the map.
   a) What is the height of this spot height?
   b) Use clues from the map to describe the land in this area.

2. a) What is the height of the contour line that passes near Linford?
    b) Name the constructed feature that is built across the perennial river on this contour line.
    c) Describe the gradient of the land in this river valley.

3. a) Give the exact height of the trig beacon in the south-west corner of the Ixopo topographic map.
    b) What is the number of this trig beacon?

4. Give the height of all the bench marks along the arterial road south of Ixopo.
Word bank  

**ridge** a narrow highland area of even height that often has steep sides

3. **Contour patterns showing river valleys, hills, mountains, ridges and spurs**

We will examine four landforms that are common on topographic maps of South Africa. You already know what the contour patterns for river valleys and spurs look like.

**River valleys**

Some river valleys have steep slopes, while others have more gentle slopes. The contour pattern depends on the gradient of the river valley.

**Hills and mountains**

Mountains are much higher than hills. The contour pattern shows us the height, gradient and shape of hills and mountains.

The contour pattern of a steep river valley

A river valley

The contour pattern of mountains and hills indicates shape, gradient and height.
Spurs and ridges
The contour pattern of **ridges** and spurs can sometimes look the same. You need to examine the heights and shape of the contour lines to help you decide which pattern shows a ridge and which pattern shows a spur.

**Spurs**
You have already learnt on page 6 that spurs are pieces of land that extend into or between river valleys. The U shape of the contour line points downhill.

**Ridges**
Ridges can form a part of hills and mountains. Ridges are bigger than spurs. The height of a ridge is similar along its highest points. A spur is always a sloping piece of land.
Word bank

**ratio** compares one number to another number of the same unit

4. **Scale and measuring distance on topographic maps – using line and ratio scales**

**Ratio scale**

All 1:50 000 maps have a **ratio** scale of 1:50 000. This means one unit of measurement on the map represents 50 000 units of the same measurement on the land.

- One millimetre on a 1:50 000 map represents 50 000 millimetres on the land.
- It is useful to convert millimetres to metres because 50 000 mm is difficult to imagine. There are 1 000 mm in 1 m.
- 50 000 mm is the same as 50 m.
- Every millimetre on a 1:50 000 topographic map represents 50 m on the ground.

<table>
<thead>
<tr>
<th>Conversion table</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 mm = 1 cm</td>
</tr>
<tr>
<td>100 mm = 10 cm</td>
</tr>
<tr>
<td>1 000 mm = 1 m</td>
</tr>
<tr>
<td>10 000 mm = 10 m</td>
</tr>
</tbody>
</table>

**How to convert map distances to ground distances using ratio scale**

1. Use a ruler to measure the distance between two places on the map, e.g. 160 mm
2. Check the ratio scale of the map, for example 1:50 000. Multiply the map distance by the map scale. In the above example this will be: 160 mm \( \times \) 50 000 = 8 000 000 mm.
3. We do not usually describe distances on the ground in millimetres. We use metres or kilometres. We can convert 8 000 000 mm to metres by dividing 8 000 000 by 1 000. 8 000 000 mm \( \div \) 1 000 = 8 000 metres
4. We can convert 8 000 metres to kilometres by dividing by 1 000. 8 000 m \( \div \) 1 000 = 8 km
Line scale

In earlier grades you used line scale to calculate distances on maps. The line scale shows the distance on the map compared to distance on the ground. Line scales may compare millimetres or centimetres on the map with metres or kilometres on the ground.

The line scale on the 1:50 000 topographic map shows the ground distance as metres. The line is marked in 1 000-metre sections. There are 1 000 metres in one kilometre.

Classroom activity 1.7

Work on your own and complete these tasks. You will use the line scale on this page.

1. Use a ruler to measure the centimetre length of 1 000 m on the line scale.

2. Decide which of the following sentences are correct. Re-write each one as a true sentence.
   a) One centimetre on the line scale represents 500 metres on the ground.
   b) 500 metres on the ground is the same as one millimetre on the map.

3. What will be the ground distance between two places if the map distance is 10 cm?

4. Calculate the ground distance of a journey that measures 450 mm on the map.

5. a) How many millimetres on the map will represent 500 000 mm on the ground?
   b) State 500 000 millimetres as metres.
### 5. Co-ordinates to locate features

In Grade 8 you learnt how to locate places on atlas maps using degrees and minutes. Topographic maps have a co-ordinate grid around the edges of the map. Topographic maps are large-scale maps so they only show a small area of land. The map on this page covers only 4 minutes of latitude and 3 minutes of longitude.

An **alpha-numeric** grid has also been marked along each of the minute lines to make it easier to locate features. You have used grids since Grade 4. The map extends from 28° 00' E to 28° 04' E and 26° 15' S to 26° 18' S.

![A topographic map showing an area in southern Johannesburg](image)

### Classroom activity 1.8

Work on your own and answer these questions.

1. Name the suburbs in grid squares B3 and C4.
2. Give the height at the spot height in block C1.
3. Which line of latitude is trig beacon 308 in C2 located close to? Give your answer in degrees and minutes.
4. What line of longitude passes through the suburb of Winchester Hills in B1?
5. Name two natural and two constructed features in block C2.
6. a) Give the grid squares where more than half the land is not covered with buildings.
   b) How is the land used in this area?
Unit 4  Information from maps and photographs

1. Interpret information from topographic and orthophoto maps and aerial photographs

In this section you will examine information from orthophoto maps, aerial photographs and topographic maps. Each of these kinds of images helps us to observe features on the ground, including land use and settlement patterns.

In Grade 8 you learnt that there are two kinds of aerial photographs: vertical and oblique. Vertical aerial photographs are more useful to use with maps because they show the map view of the land. Oblique aerial photographs give you a better idea of what objects look like.

An orthophoto map of part of Johannesburg
Describe landscape

The contour lines on the orthophoto map of Johannesburg help you to describe the height and shape of the land. You can see which areas are flat or hilly. You know that the contour interval on an orthophoto map is 5 metres. This helps you to describe the gradient of the landscape. Spot heights on the topographic map give the exact height of the land above sea level. Most of the land is covered with buildings or roads. The shadows suggest that there are tall buildings in the northeast part of the orthophoto map. You can say that this area is an urban landscape on gently sloping land.

Classroom activity 1.9

Examine the orthophoto map showing part of Johannesburg.

1. Identify the following features: a railway, a motorway, two arterial roads.

2. a) Look for examples of the following: tall buildings, buildings that cover a large area, buildings that cover a small area.
   
   b) Suggest ways that each of the kinds of buildings could be used.

3. a) Identify areas where you can see the following kinds of land use: residential housing, industrial land use, old mine dumps, shops and offices, recreational areas, transport (including car parks).
   
   b) Suggest reasons for the location of these kinds of land use.

4. a) Examine the height clues on the orthophoto map. How high is this area above sea level?
   
   b) Describe the relief of the landscape. Use the words gradient, hill, slope and flat in your description.

Identify land use

Aerial photographs and orthophoto maps show realistic views of the land from above, which helps you to identify different kinds of land use. Tall buildings are often offices or flats. Large buildings may be factories or warehouses. Shopping centres may be a group of large buildings with big car parks next to them. Transport routes and roads stand out as lines in between the buildings. You can identify the sports stadium on the aerial photographs on this page. This land is used for recreation. There are areas where there are trees and open spaces with no buildings. These areas may be recreation areas such as parks.

Symbols and names on topographic maps help you to identify land use. You can identify the roads and railway on the topographic map on page 21. The colour shading shows you which areas are built up and if they are high or low density areas. Map symbols and names show you where there are mine dumps, parks, schools, churches and recreation areas.
2. Settlement patterns

The topographic map, aerial photographs, and orthophoto map on these pages enable you to describe the settlement pattern in part of Johannesburg. Remember the settlement pattern is the shape that all the buildings make on the land. You can say that this is a densely settled area. There are tall buildings in the CBD and larger low rise buildings in the industrial areas. The street pattern in most of the suburban areas is regular blocks. The city has a central core of high rise buildings with suburbs extending to the north and factories occupying much of the area south of the railway line. Maps of larger areas show the pattern made by a number of settlements on the land, the distances between them, the shape of the settlements, and whether they are rural or urban settlements.
Classroom activity 1.10

1. Examine the 1:50 000 topographic map of Johannesburg above. Find the areas shown by the letters A, B and C in the aerial photograph at the top of page 22.

2. Examine the topographic map of Johannesburg.
   a) Name the nearest railway station to the sports stadium.
   b) Name two other kinds of recreational land use you can identify on the map.

3. Look for evidence from the map and from the aerial photographs that suggests the stadium is close to an industrial area.

4. Describe the landscape of the area shown on the topographic map. Mention height and relief, land use and transport.

Homework activity

Study the topographic map of Johannesburg at the top of this page.

1. Draw a simple sketch map to show the following kinds of land use shown on the map: residential, industrial, transport, recreation.

2. Find the symbol for a mine dump on the map. How could mining have influenced:
   a) land use
   b) the settlement pattern of this area?

3. Use the map scale (1:50 000) to calculate the length of the railway across the map.
Summary

- Contour lines are lines on maps that show the height and shape of the land.
- Each contour line shows the height of the land above sea level.
- The difference in height between contour lines is the contour interval.
- Contour lines that are close together show a steep slope.
- Contour lines that are far apart show a gentle gradient.
- You can identify features on maps from the shape of the contour lines.
- Orthophoto maps are a combination of a vertical aerial photograph and a map.
- Orthophoto maps show contour lines and names of places. They also show height in different ways.
- Spot heights, contour lines and trig beacons show height on orthophoto maps.
- The combination of visual information and map information helps you to identify features.
- Topographic maps contain a range of visual symbols that represent an area of land.
- There are symbols to show natural features such as rivers, mountains and lakes.
- Symbols also show constructed features such as settlements and roads.
- Height is shown by contour lines, spot heights, trig beacons and bench marks.
- Landscape features such as river valleys, spurs, hills, mountains and ridges have distinct contour patterns on topographic maps.
- The most commonly used topographic map scale is 1:50 000. This is a ratio scale: one unit of measurement on the map represents 50 000 of the same units on the ground.
- A line scale shows the map scale as a line which can be used to measure distances on the map and on the ground.
- Co-ordinates help you to locate places on maps. You can use an alpha-numeric grid as well as degrees and minutes to locate features on maps.
- Topographic maps, orthophoto maps and aerial photographs help you to interpret information about the land.
- Each source offers a different way of representing the land.
- Studying an orthophoto map and an aerial photograph of a place helps you to describe landscapes, identify land use and explain settlement patterns.
Formal assessment tasks

Activity 1 (15 marks)

Study the sketch map with contours on this page.

1. Identify each of the landscape features at points A, B, C and D. (4)
2. What is the contour interval on this map? (1)
3. What do we call the height feature with the number 969? (1)
4. Suggest a place on the map where you might find a trig beacon. Give a reason. (2)
5. Which part of the map shows the highest land: north-east, north-west, or south? Give reasons for your choice. (2)
6. Draw the contour lines to show a place on the map that has a gentle gradient. (2)
7. a) Identify a place where a river could be but is not shown on the map. (1)
   b) In which direction would the river be flowing? Why? (2)

Activity 2 (25 marks)

Study the part of the 1:50 000 topographic map of Queenstown on page 26.

1. a) State the highest point on this map. (1)
   b) Which method of showing height is used to indicate this height? (1)
   c) Name another method of showing exact height on this map. (1)
   d) Write the height of the location you identified in b), using the correct style. (2)
2. Use names and compass directions to describe the part of the map where the contour lines show there are spurs and river valleys. (2)
3. Describe the gradient of the land at:
   a) Bibby’s Hoek (1)
   b) Komani Park (1)
4. a) Identify and name an area where there is permanent water. 
   b) Is this water part of a natural or a constructed feature? Explain your answer. (1) 
5. Use the map scale to work out the combined length of the southern and eastern 
   borders of the Lawrence de Lange Nature Reserve. Give your answer in km. (2) 
6. Calculate the straight line distance in kilometres between trig beacons 194 and 293. (2) 
7. Identify the following kinds of land use. Make a simple drawing of each symbol. 
   a) Recreational land (1) 
   b) Cultivated land (1) 
   c) Cemetery (1) 
   d) Sewage works (1) 
8. Identify natural features that may have influenced the location of Queenstown. (1) 
9. Describe the shape and the size of the settlement pattern of Queenstown. 
   Look at the roads and the scale for clues. (2) 
10. Give reasons why Queenstown is more likely to expand to the south-east than 
    to the north. (2)