

A Guide to Scale and Map Work

Teaching Approach

This series consist of four lessons which should be played in order. This is to help the learner to get a comprehensive understanding of the concept being built up.

With maps learners have to be able to read different kinds of maps, and calculate the distance from one place to another. This is done in lesson 1 and lesson 2. This map section offers learners an opportunity to explore different modes of transport and work with different forms of maps. In lesson 3 travel cost by train, bus and car are calculated. To travel from one place to another, directions are important. It is important that learners learn how to give appropriate directions and use the correct language to provide directions. This is explained further in lesson 3 and 4. Lesson 4 mainly addresses the use of compass direction when one travels and when one provides direction.

The task lesson is provided either as additional practice for the learners, or as an assessment tool to evaluate how much they have learned in this section of work.

Video Summaries

Some videos have a 'PAUSE' moment, at which point the teacher or learner can choose to pause the video and try to answer the question posed or calculate the answer to the problem under discussion. Once the video starts again, the answer to the question or the right answer to the calculation is given.

Mindset suggests a number of ways to use the video lessons. These include:

- Watch or show a lesson as an introduction to a lesson
- Watch or show a lesson after a lesson, as a summary or as a way of adding in some interesting real-life applications or practical aspects
- Design a worksheet or set of questions about one video lesson. Then ask learners to watch a video related to the lesson and to complete the worksheet or questions, either in groups or individually
- Worksheets and questions based on video lessons can be used as short assessments or exercises
- Ask learners to watch a particular video lesson for homework (in the school library or on the website, depending on how the material is available) as preparation for the next days lesson; if desired, learners can be given specific questions to answer in preparation for the next day's lesson

1 Working with Scale

In this lesson two types of scales and their use are addressed. The focus is on representation of the scales and their uses to find distances. Calculations of actual distances are shown especially when measurements are known.

2 Using Maps

There are different kinds of maps that are used in this lesson. Calculation of the distance of objects from each other is done using the scale of the map. Maps with and without grid references are analysed and used.

3 Going on a Trip

We practically estimate the distance between two location using maps showing different perspectives of the locations. We also compare two modes of transport for travelling and decide which one will be better.

4 Finding Direction

In this lesson compass directions and road signboards are looked at. The focus is on how to use compass direction such as N, S, W, and E to give direction from one destination to another.

Resource Material

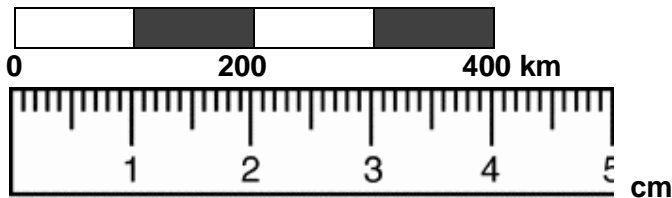
Resource materials are a list of links available to teachers and learners to enhance their experience of the subject matter. They are not necessarily CAPS aligned and need to be used with discretion.

1 Working with Scale	http://www.travelrelation.com/packages/south-africa/images/south-africa-map1.gif	This link has map that shows the number scale that is used to calculate the distance on the map.
	http://www.khulasizwe.com/files/maps/south_africa_map_3.gif	This link has map that shows the bar scale that is used to calculate the distance on the map and to find a number scale
2 Using Maps	http://commons.wikimedia.org/wiki/File:Pushpak_Bus_Routes_Map.jpg	This is a link to a bus route map. It is used to show learners what a bus route map looks like and that the bus route has three to four paths that can be used
	http://commons.wikimedia.org/wiki/File:Jordanhill_station_open_street_maps.png	This shows a street map. This map helps learners to be able to read information from the map and to be able to differentiate between maps
	http://1.bp.blogspot.com/-6vrrWLvucRs/T9gXK48HXsl/AAAAADJg/-yxVFoRwMuY/s1600/Route+Profile.jpg	This link is for a profile map of a marathon. It shows the high and lows of the distance runners have to run
3 Going on a Trip	http://southafricanrailways.co.za/premier_classe_timetable.html	Railway timetable for long distance trip, it is used to calculate the cost for using a train
	http://www.travelrelation.com/packages/south-africa/images/distance-chart.gif	This is a distance chart link. The chart is used to provide distance from one destination to another without calculation.
4 Finding Direction	http://helenotway.edublogs.org/files/2011/01/compass-10pwuk7.PNG	This is a link for a compass. It is used to show cardinal points, which indicate direction to travel
	http://www.saspeedbumps.co.za/wp-content/gallery/road-signs/RS3.png	This link shows the signboard on the road, highway. This is used to find direction to your destination, by reading on the board on where to go.

Task

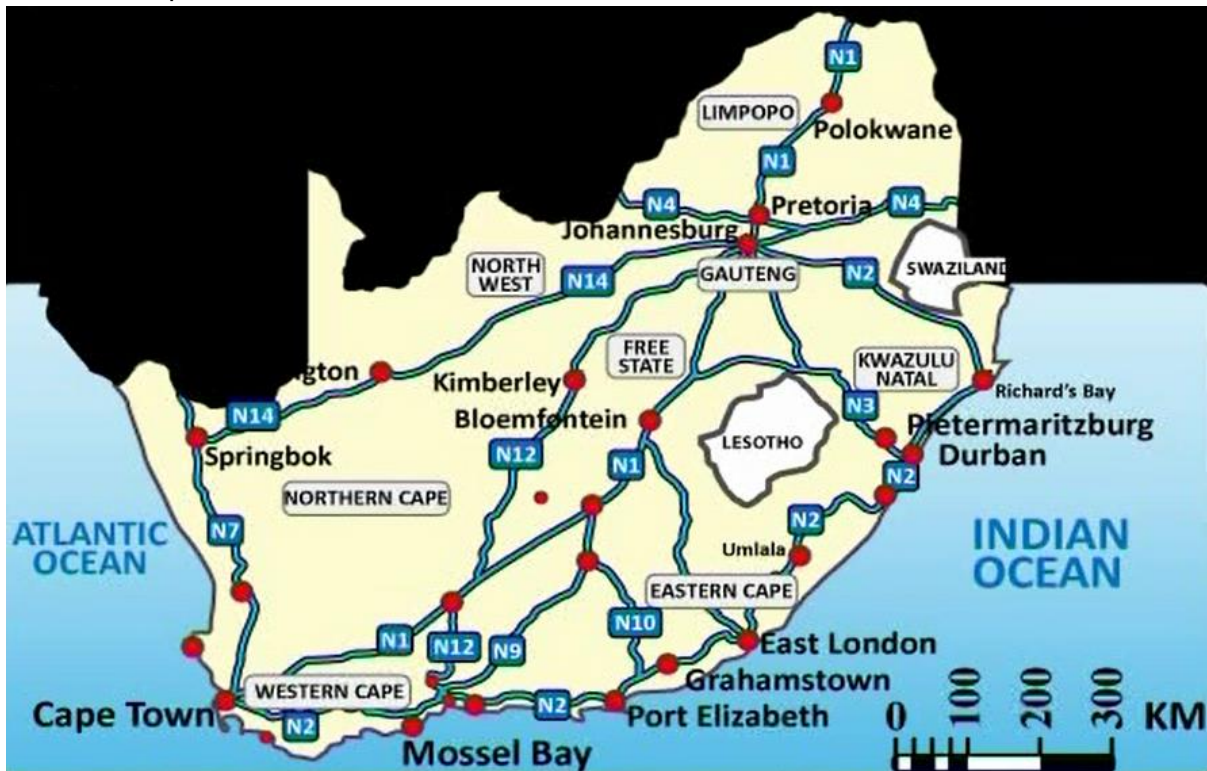
Question 1

- 1.1. What are the two types of scales used on maps?
- 1.2. What does the scale 1:300000 mean?
- 1.3. Determine the number scale for the following bar scale



Question 2

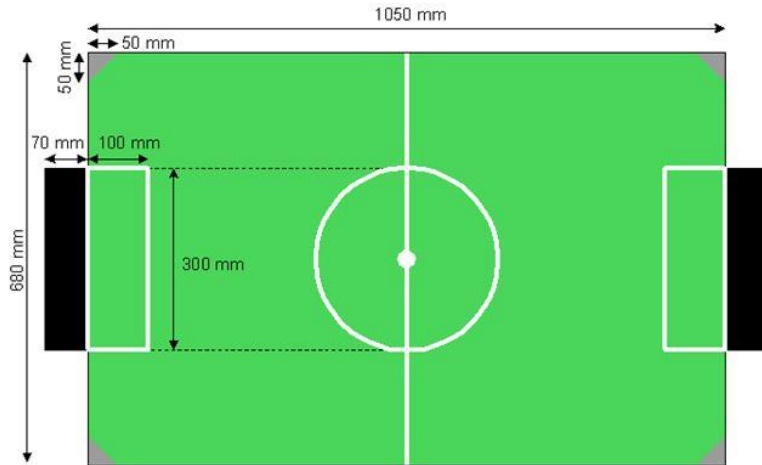
Here is a map of South Africa. It uses a bar scale to show the scale.



- 2.1 If the distance from Colesburg to Johannesburg is 8cm, determine the actual distance in kilometres.
- 2.2 The actual distance from Middleburg to Colesburg is 20 km what is the distance on the map in centimetres.
- 2.3 The distance from point A to point B is 40km, and the measurement on the map is 5,5 cm. Find the scale of the map.

Question 3

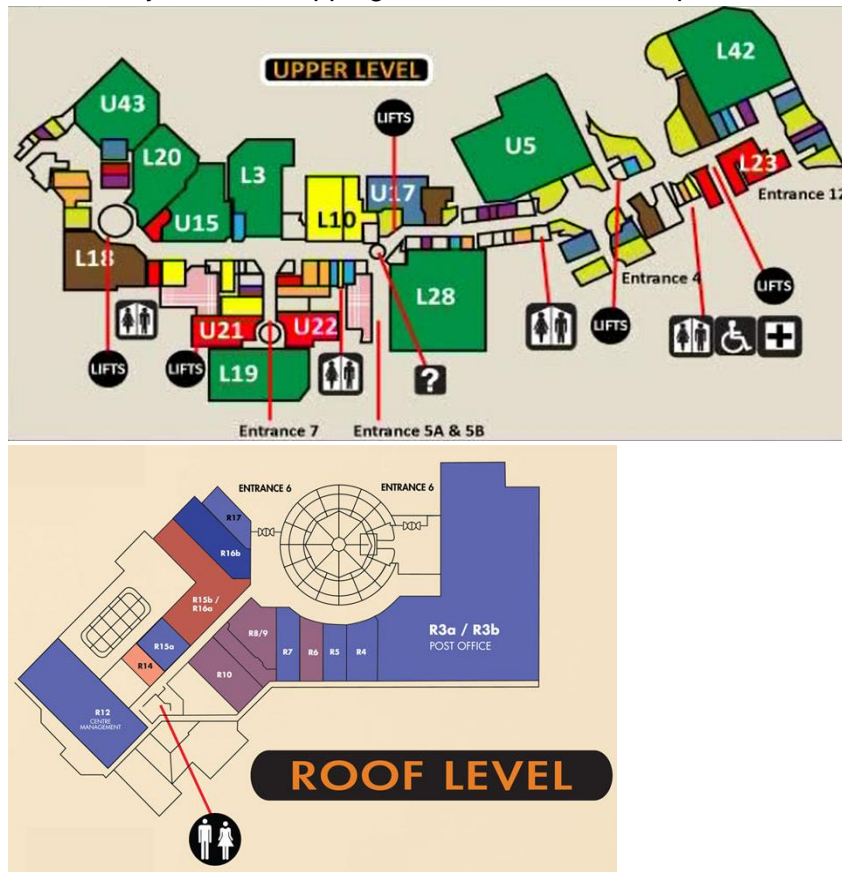
Here is the layout of a school soccer field.



- 3.1 Convert the length and the breadth of the goal post into metres
- 3.2 The length of the front of the goal post is 3,5 cm. Find the number scale for this map

Question 4

Use this layout of a shopping centre to answer the questions.



- 4.1 How many toilets are in the upper level?
- 4.2 How many entrances does the upper level have?
- 4.3 How many shops are in the roof level?

Question 5

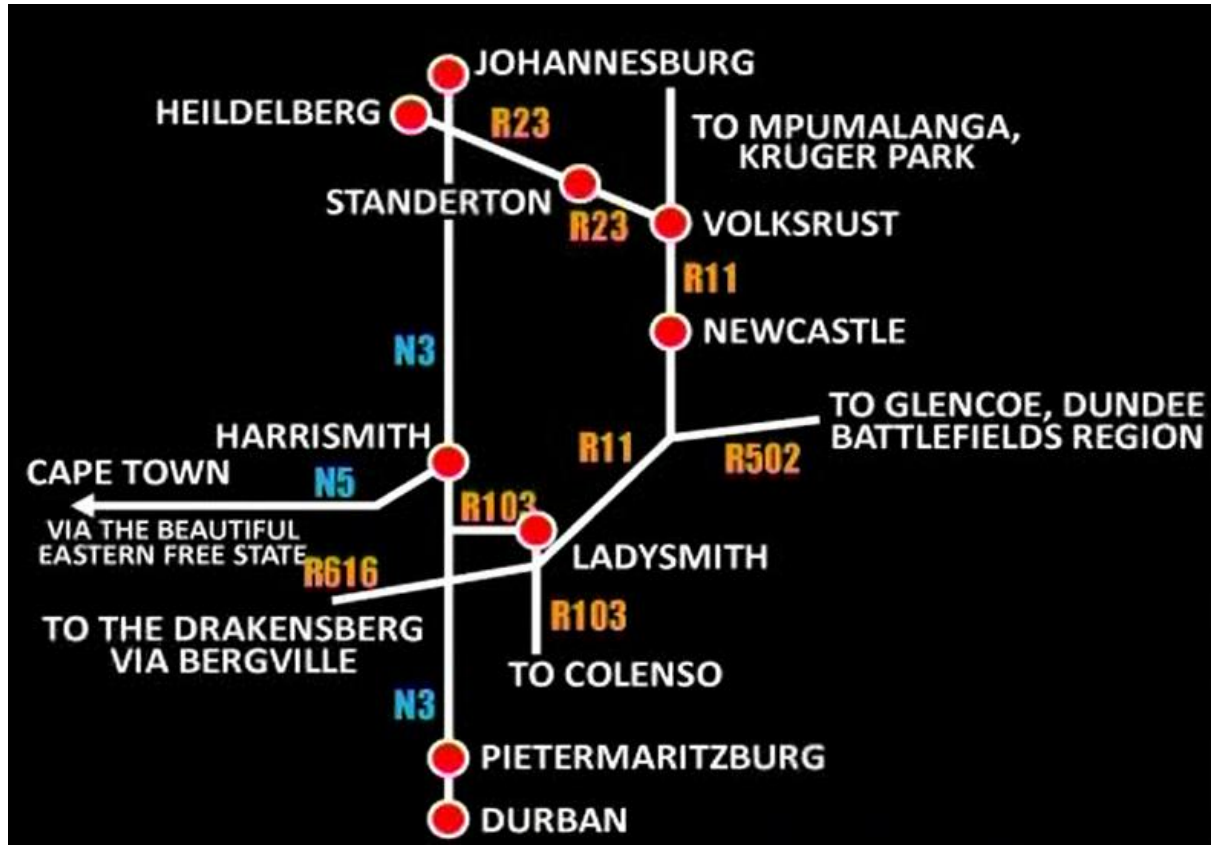
This street map has a grid laid over it.



- 5.1 In which grid reference do we find Bloemhof Girls High School?
- 5.2 Which road is found at A2?
- 5.3 Provide the directions from petrol garage at Dorp Street to Du Toit station.

Question 6

Study the map from Johannesburg to Durban and answer these questions



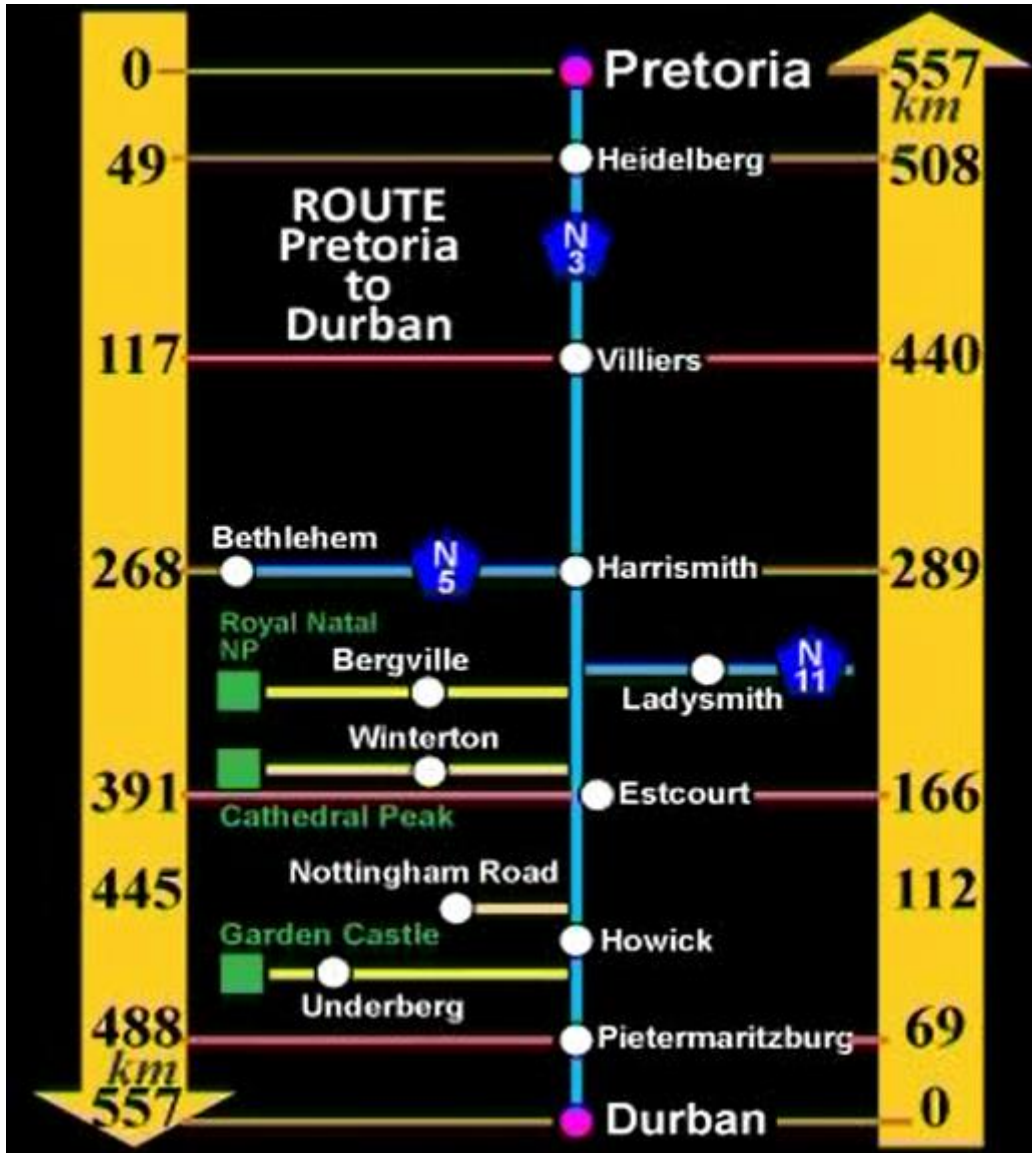
6.1 What type of a map is this?

6.2 Which road is used to travel from Durban to Dundee?

6.3 Name the national route that can be used to travel from Pietermaritzburg to Johannesburg.

Question 7

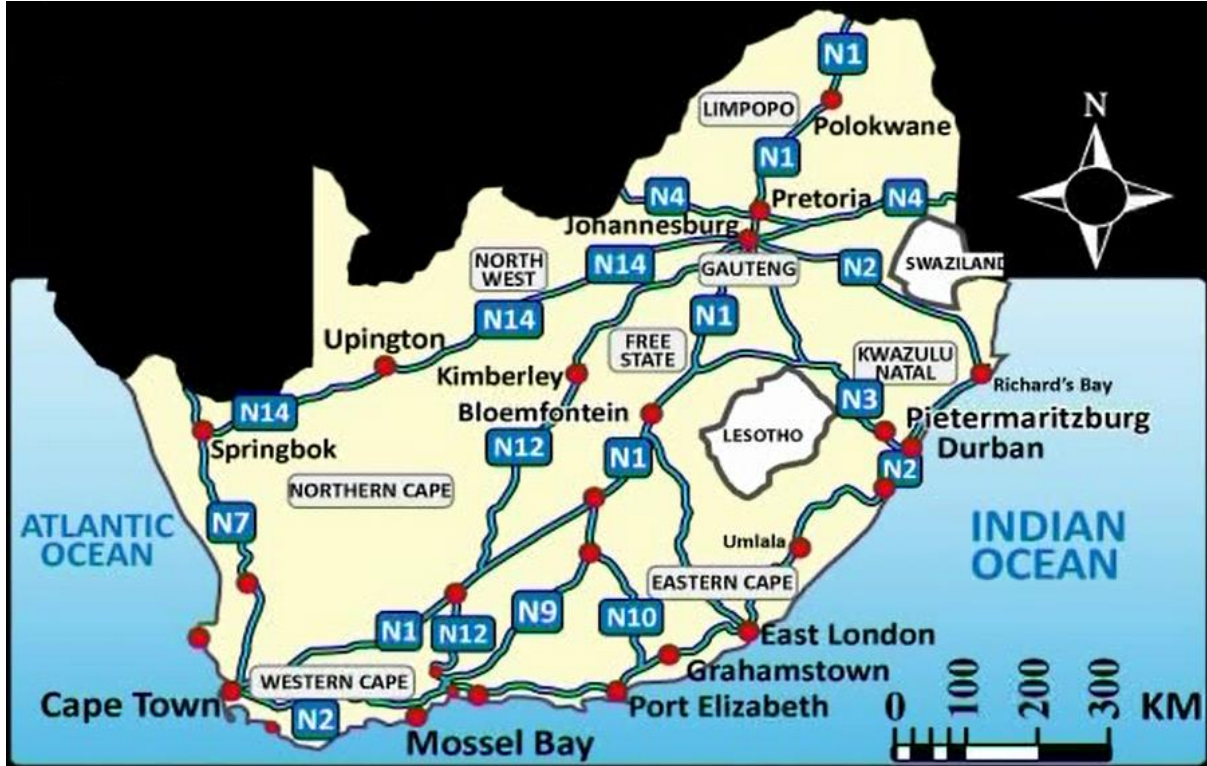
The strip map shows the route from Durban to Pretoria



- 7.1 Letisha travels from Pietermaritzburg to Heidelberg. Use the map to calculate her total distance travelled.
- 7.2 Calculate how long it will take her to arrive at her destination if she drives at 110 km/h
- 7.3 Letisha drives a car that has a tank that can hold 60 litres of petrol. Her car travels 7,5 km/l. How much will it cost her for a full tank if the price of petrol is R13,10 per litre?
- 7.4 Calculate Letisha's petrol cost for the return trip

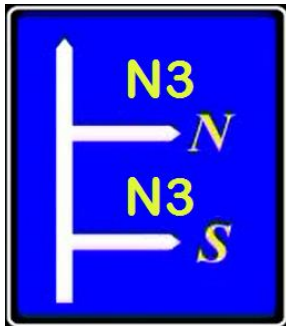
Question 8

Refer to the following map to answer the following questions



8.1 Identify the national road/s in the map.

8.2 Use compass directions to give directions on how to travel from Upington to Bloemfontein.



8.3 Jabulane is driving from Bloemfontein to Durban. He comes to this sign at Harrismith. Which turn off should he take and why?

Task Answers

Question 1

- 1.1 Bar scale and number scale
 1.2 For every one unit on the drawing or map there is 300 000 units in reality
 1.3 4cm : 400km
 4: 400 x100 000
 4: 40 000 000
 1:10 000 000

Question 2

2.1

Method 1

Bar scale 1,5cm : 300km
 8 cm : D
 $1,5 \times D : 8 \times 300$
 $D = 1600 \text{ km}$

Method 2

Find the scale first
 $1,5 : 300$
 $1,5 \text{ cm} : 300 \times 100000$
 $1,5 \text{ cm} : 3 000 0000$
 $1 : 20 000 000 \text{ scale}$
 $D = \frac{8 \times 20 000000}{100000}$
 $D = 1600 \text{ km}$

2.2

Method 1

Bar scale 1,5cm : 300km
 $m : 20$
 $300 \times m : 20 \times 1,5$
 $D = 0,1 \text{ cm}$

Method 2

Use the scale
 $1 : 20 000000 \text{ scale}$
 $m = \frac{20 \times 10 0000}{20000000}$
 $m = 0,1 \text{ cm}$

- 2.3 40km = 5,5 cm
 40km: 5,5 cm
 $40 \times 100000 : 5,5$
 $40 000000 : 5,5$
 $727272,72 : 1$ round off to the nearest unit
 $1 : 727270$

Question 3

- 3.1 $L = 300 \text{ mm} \div 1000$ $B = 100 \div 1000$
 $L = 0,3 \text{ m}$ $B = 0,1 \text{ m}$
- 3.2 $0,3 \text{ m} = 3,5 \text{ cm}$
 $0,3 : 3,5 \text{ cm}$
 $0,3 \text{ m} \times 100 : 3,5$
 $30 : 3,5$
 $8,57 : 1$
 $1 : 9$ round off to the nearest unit

Question 4

- 4.1 There are 4 toilets
 4.2 There are 3 entrances
 4.3 There are 12 shops on the roof level

Question 5

- 5.1 D2
 5.2 R304
 5.3 From the Garage go down Dorp street until the robots, at the robots turn right to R44 strand street, continue with Strand street until a T-Junction, turn right to Adamtas street continue up until you find a set of robots, turn left on the first robots to George Blake street, continue with George Blake street, pass John Costa street, pass Industria street, pass Rand street then Du Toit station will be on your left

Question 6

- 6.1 Strip route map
 6.2 R103 and R602
 6.3 N3

Question 7

- 7.1 Distance at Heidelberg is 508 km and the distance at Pietermaritzburg 69 km
 $508 - 69 = 439$ km
 7.2 $time = \frac{distance}{speed}$
 $time = \frac{439}{110}$
 $time = 4$ hour
 7.3 Cost for fuel tank = R13,10 x 60
 $= R786,00$
 7.4 Cost for return trip = R786,00 x 2
 $= R1572,00$

Question 8

- 8.1 N1, N2, N3, N4, N7, N12, N14
 8.2 From Upington drive towards Easterly direction with N14 continue until you reach Johannesburg. At Johannesburg take N1 South and continue down with N1 until reach Bloemfontein.
 8.3 From the map, Durban is on the Southerly direction from the side he is coming from. He should take N3 S (N3 south route).

Acknowledgements

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