



GRADE 10 EXEMPLAR EXAMINATION
NOVEMBER 2006

MATHEMATICS LITERACY
PAPER 2

Minimum time: 1 ½ hours
Maximum time: 2 hours

75 marks

PLEASE READ THE FOLLOWING CAREFULLY

1. This paper consists of:
 - 4 questions
 - an answer sheet with grid paper for question 3-(b).
 2. Answer all the questions.
 3. Calculators may be used in all questions.
 4. A ruler and/or piece of string is needed for Question 1.
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QUESTION 1: PARLINGTON ESTATE

A new housing complex called *Parlington Estate* is being developed. A plan of the *Parlington Estate* is given on the next page.

Use this plan to answer the following questions.

- (a) (i) How many plots of land are there in the complex? (1)
- (ii) Write down the number of the largest plot of land in the complex. (1)

- (b) A truck carrying bricks is given the following directions:
Enter the complex from Dong Street. Turn right into Vlei Avenue and continue driving until Vlei Avenue comes to an end. Turn left into Straight Street and then right into Main Road. Drive along Main Road for approximately 600 m and then turn left into Circle Drive. The plot of land is the last plot on the left hand side of Circle Drive.

What is the number of the plot of land that the truck is delivering the bricks to? (2)

- (c) (i) How many millimetres on the map is equal to 1 km in actual distance? (1)
- (ii) Rory Poeppenagel lives in a house on Plot 9. Every morning Rory runs the following route around the housing complex:
Down Straight Street; right into Circle Drive; across Main Road; left into Ding Street; left into Morris Street; left into Vlei Avenue; right into Straight Street; back home.

Use the bar scale to determine how many kilometres Rory runs every morning. (3)

- (d) On a particular day a courier from the chemist arrives on his bicycle at the south entrance of Main Road to deliver medicine to the people living in houses on Plots 1, 10 and 31.

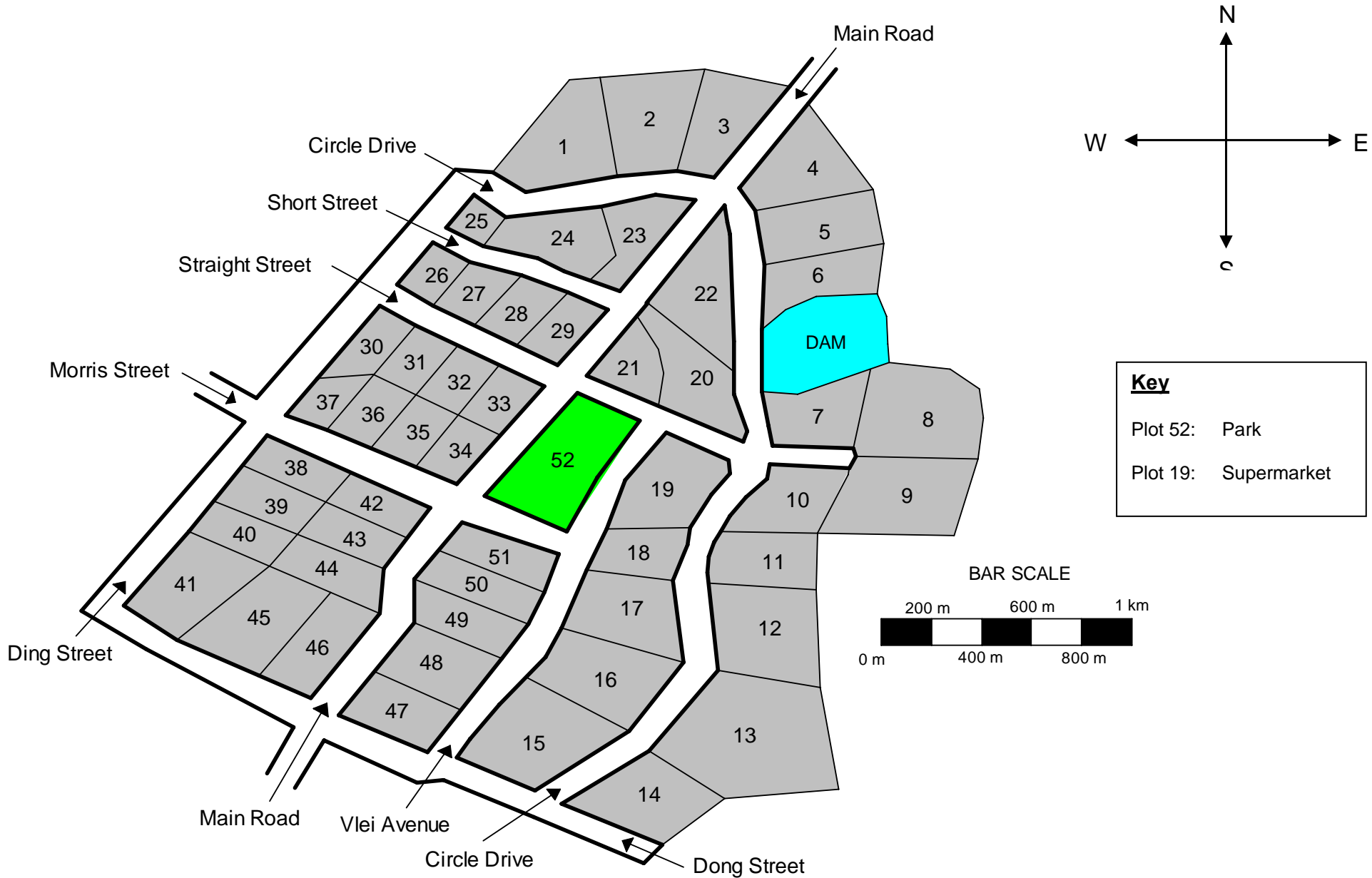
Describe the shortest route that the courier should take to deliver the medicine to these three houses. (3)

- (e) Plot 22 and Plot 5 are selling for the same price and Jack and Jill are considering buying one of these plots of land.

- i) Calculate the approximate areas of Plot 22 and Plot 5 in m².
- ii) Jack and Jill decide to buy Plot 5. Write down two reasons that could have influenced their decision. (2)

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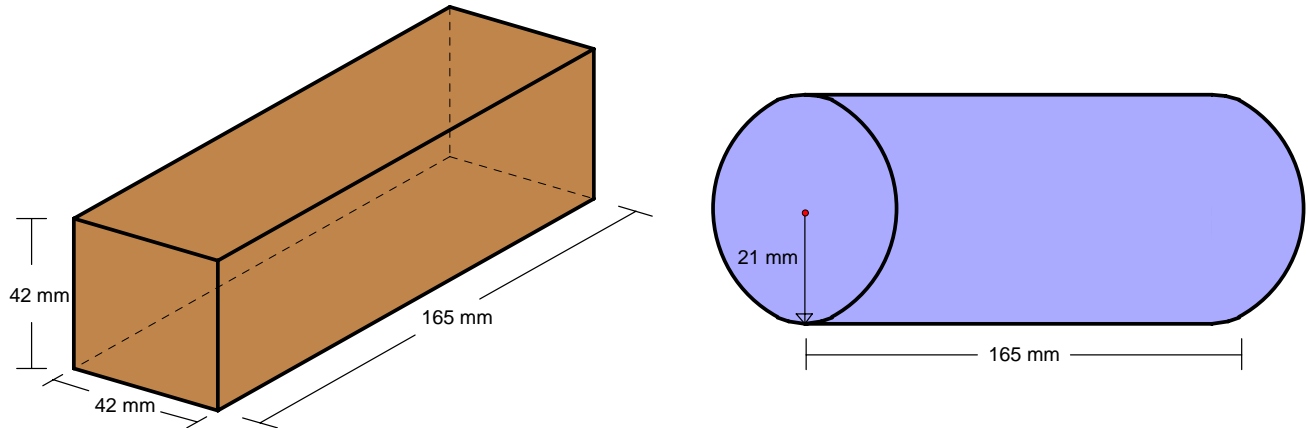
PARLINGTON ESTATE



QUESTION 2: BILLY’S BOX BUSINESS

Billy is employed at a business that designs and makes packaging for small balls, fruit juice and biscuits. One of the first tasks that Billy is given is to design packaging for squash balls.

The pictures below show the dimensions of a rectangular box and a cylindrical container that Billy is considering using to package the squash balls.



- (a) (i) If a squash ball has a diameter of 40 mm, how many squash balls is a box or a container designed to hold? (1)
- (ii) Why do you think both the rectangular box and the cylindrical container are slightly longer and higher than they need to be? (1)
- (b) A net is a 2-dimensional picture of what an object looks like before it is folded into 3-dimensional shape.
 Draw a *rough* net for the rectangular box and for the cylindrical container.
- *The nets do not have to be drawn to scale.*
 - *The dimensions of the various parts of the box and container must be filled in on the net.* (4)
- (c) (i) Calculate how much cardboard Billy needs to build the rectangular box. (3)
- (ii) The circumference and area of a circle are calculated using the following formulae:
 $Area\ of\ a\ circle = \pi \times radius^2$
 Circumference of a circle = $\pi \times diameter$
 Use these formulae, or any other method, to show that Billy will need 24 542,63 mm² of cardboard to build the cylindrical container. (4)
- (iii) Based on your calculations above, would it be cheaper for Billy to package the squash balls in the cylindrical container or the rectangular box?
 Explain your answer. (2)

- (d) If you walk around the shops, you will notice that most squash ball manufacturers package their squash balls in rectangular boxes. Most golf ball and table tennis ball manufacturers also use rectangular boxes.
Why do you think this is the case? (1)
- (e) The company that Billy works for also uses rectangular and cylindrical containers with the same dimensions as the squash ball containers to package fruit juice.
- (i) How much fruit juice (in mm³) is the rectangular container able to hold? (2)
- (ii) If 1 mm³ = 0,001 ml how many millilitres of juice is the rectangular container able to hold? (1)
- (iii) The formula for calculating the volume of a cylinder is:
volume of a cylinder = π × (radius of the lid)² × height of the cylinder

Use this formula to calculate how many millilitres of fruit juice the cylindrical container will be able to hold. (3)
- (iv) If a rectangular container and a cylindrical container of fruit juice are sold for the same price, which would you buy? Explain your answer. (1)
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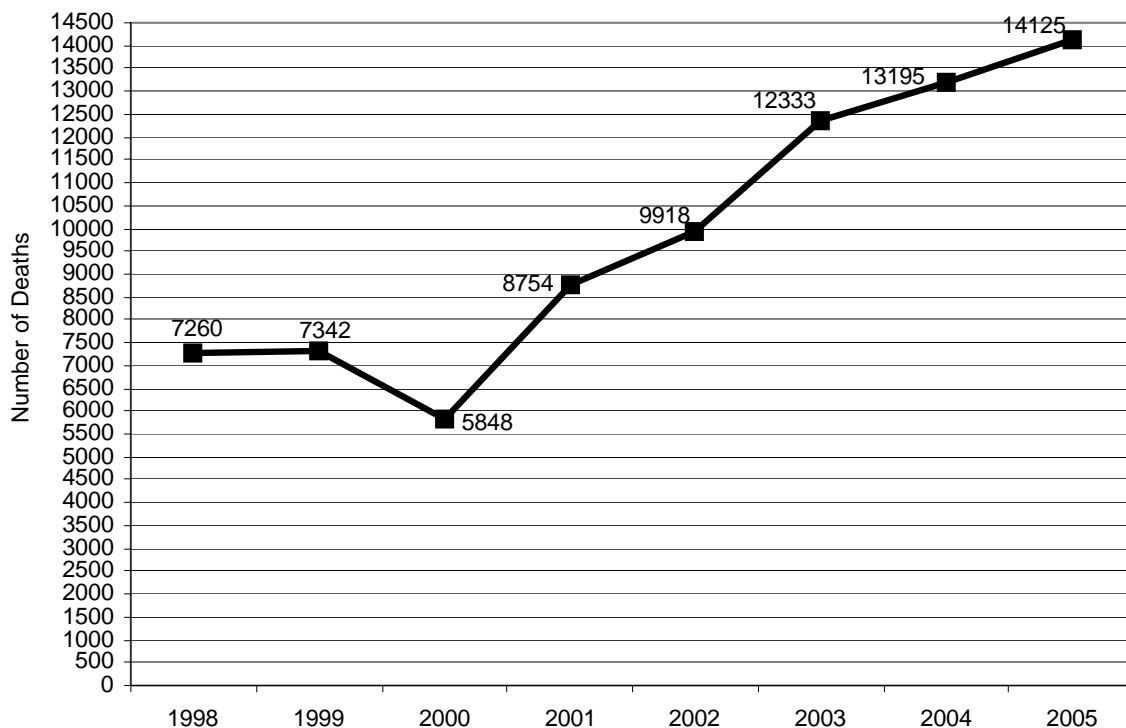
QUESTION 3: ZANELE’S UNDERAGE DRINKING STUDY

Zanele has been collecting data on the students in her school who are under the age of 18 years and who drink alcohol.

The tally table below contains the data that Zanele collected from her classmates.

Grade	Number of students surveyed in each grade	Boys under the age of 18 years who drink alcohol	Girls under the age of 18 years who drink alcohol
8	50		
9	50		
10	50		
11	50		
12	50		

- (a) (i) How many boys in Grade 11 who are under the age of 18 years drink alcohol? (1)
- (ii) In which grade did underage drinking occur the most? (1)
- (iii) How many of the students surveyed in Grade 9 do not drink alcohol? (1)
- (b) Draw a double bar graph to show the number of boys and girls in each grade who drink alcohol.
Answer this question on the grid paper provided on the answer sheet on the last page of the exam. (4)
- (c) From the data that she has collected, Zanele makes the following deduction:
“It is clear from the data that more underage boys than girls drink alcohol.”
Do you agree with Zanele’s deduction? Explain your answer. (2)
- (d) According to the *1ST South African Youth Risk Behaviour Survey 2002*, 31,8% of all of the students in South Africa under the age of 18 years drink alcohol on a regular basis.
Compare this figure to the results of Zanele’s survey and make a deduction about whether you think there is a problem with underage drinking at Zanele’s School. (3)
- (e) If you are told that there are 1 028 students in Zanele’s school, do you think the results of Zanele’s survey are accurate? Explain your answer. (2)
- (f) Zanele finds the following line graph on the *Arrive Alive* website. The graph shows the total number of deaths as a result of vehicle crashes on South African roads over the period 1998 to 2005. (Source: Arrive Alive – www.arrivealive.co.za, 23 August 2005)



- (i) In which year did the death rate from vehicle crashes decrease? (1)
 - (ii) In 2005 approximately 8 400 people who died as a result of vehicle crashes had been drinking alcohol. What percentage of the total number of deaths for 2005 is this? (2)
 - (iii) How could the traffic authorities use the above graph to predict the number of road deaths in 2006? (2)
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QUESTION 4: MANDY’S HEART RATE EXPERIMENT

Some of the boys in Mandy’s class have been boasting that boys are naturally fitter than girls. Mandy decides to conduct an experiment to test whether this is correct. To do this she puts the boys into one group and the girls into another group and then makes each group do a series of push-ups, sit-ups and short sprints. She then allows each person to rest for two minutes before taking a reading of their heart rate.

The lower the person’s heart rate after the two minutes, the fitter that person is.

The table below contains the heart rate readings that Mandy has collected from the two groups.

Group 1 Girls	
Name	Heart Rate Reading (beats per minute - bpm)
Ayanda	91
Buso	96
Camilla	78
Claire	70
Elizabeth	71
Fazeelah	72
Gayle	69
Hendriette	83
Jemima	97
Khosi	67
Sandy	99
Susan	60
Thando	65
Waneeta	70
Zinhle	100

Group 2 – Boys	
Name	Heart Rate Reading (beats per minute - bpm)
Barry	52
Bobby	118
Corne	50
Farhaaz	55
Ishmael	84
Jacob	105
Jerry	90
Johannes	71
Julian	78
Mckinley	101
Milo	93
Philip	60
Simeon	84
Xolani	51

- (a) (i) Write down the heart rate of the least fit person in the class. (1)
- (ii) Write down the name of the fittest girl in the class. (1)
- (iii) Write down the names of two students who have equal fitness levels. (1)
- (b) (i) Calculate the range of the heart rates for Group 1 and Group 2. (2)
- (ii) Explain why the range of the heart rates for Group 2 is much bigger than for Group 1? (1)
- (c) (i) Calculate the mean heart rate for both Group 1 and for Group 2. (3)
- (ii) Calculate the median heart rate for Group 1 and Group 2. (3)
- (iii) Which average, the mean or the median, gives the best indication of which group has the best overall fitness? Explain your answer. (2)
- (d) How do the results of Mandy's experiment compare with the boast made by the boys in her class that boys are naturally fitter than girls? Explain. (2)

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ANSWER SHEET

QUESTION 3: ZANELE’S UNDERAGE DRINKING STUDY
(b)
