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National Senior Certificate
Grade 12
Mathematical Literacy
Paper 1

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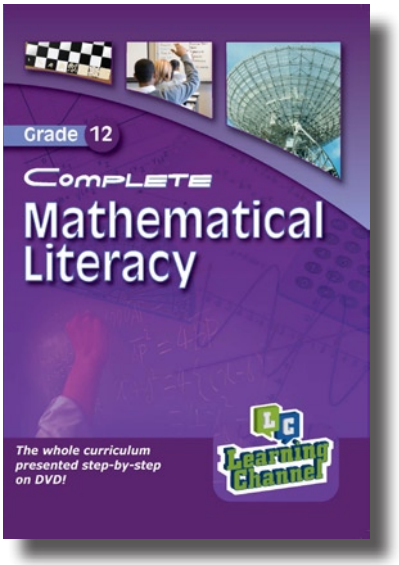
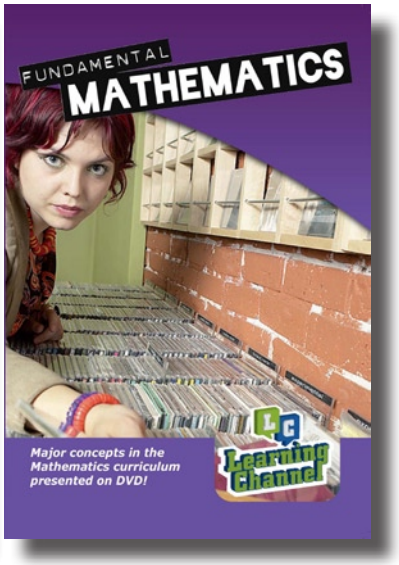




MARKS: 150 **TIME: 3 hours**

QUESTION 1

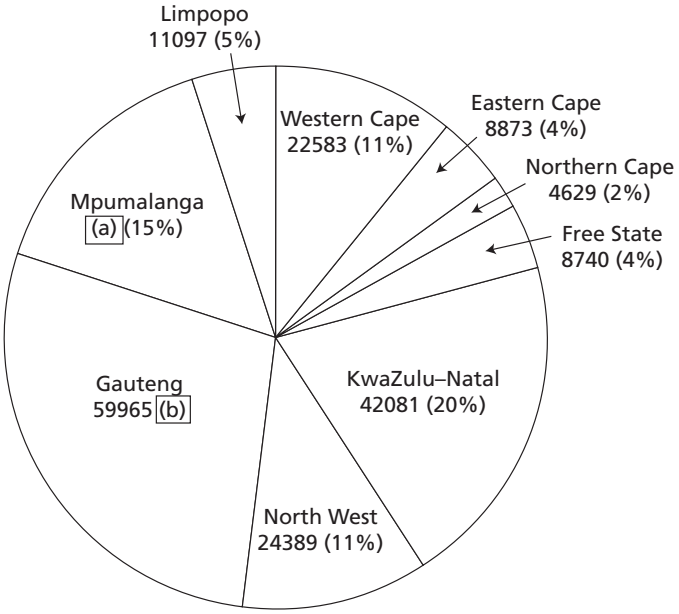
1.1 Eskom. will increase the price of electricity by:
24,8% in 2010, 25,8% in 2011, and 25,9% in 2012. At the start of 2010 the average standard price was 41,57c per kWh.

1.1.1 Show that the price after the 2010 increase will be 51,88c per kWh. (2)

1.1.2 Calculate the price after both the 2011 and 2012 increases. (4)

1.1.3 Calculate the total percentage change in the price from the start of 2010 to the end of 2012. (3)

1.2 The graph below shows the consumption of electricity (in Giga Watt hours (GWh)) as well as the percentage of national consumption by province for 2009. The total consumption for South Africa in that time was: 213 881 GWh.

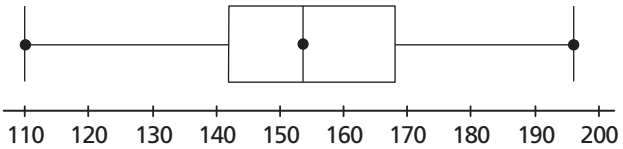


1.2.1 How many GWh of electricity did North West consume in 2009? (2)

1.2.2 What percentage of the total country's consumption did Free State account for in 2009? (2)

1.2.3 Calculate the missing values (a) and (b). (6)

1.3



1.3.1 Estimate the median score for the data summarised by the box and whisker plot. (2)

1.3.2 If the box and whisker plot represents 200 scores estimate how many scores are in the range 110 to 168. (3)

[24]

QUESTION 2

Maxine has written a booklet on the history of her school.She has a quotation from the printers which reads as follows:

- fixed costs (irrespective of number of copies printed): R5 000,00
- cost per 100 booklets printed: R1 000,00 based on market research Maxine believes that the booklet will sell if she charges R23,00 per booklet.

2.1 Use this information to complete the following table (remember to redraw the table in your answer book):

Number of booklets	100	300	500	700
Printing costs				
Effective cost per booklet				

(12)

2.2 Use the graph paper provided to:

2.2.1 Draw a graph that compares the number of booklets printed with the effective cost per booklet. (6)

2.2.2 Use the graph you have drawn to estimate (to the nearest 100) the number of books that Maxine should print in order to break even.

(a) Write down the value that you estimate.

(b) Mark the point that you used to determine your estimate clearly on the graph. (6)

2.3 Show, by calculation, that the number of booklets that Maxine will have to sell if she wants to make R5 000,00 profit is 800 (rounded to the nearest 100). (5)

2.4 Use your answer for 2.3 to determine the amount of money that Maxine will have to invest in the project in order to have a hope of making R5 000,00 profit. (3)

[32]

QUESTION 3

Maxine (referred to in Question 2) has decided to print 800 booklets and needs to take out a loan to finance the project. Maxine has R5 000,00 of her own money to invest. Her uncle has agreed to loan her the additional R8 000 that she needs on the following terms:

- Interest will be calculated on the outstanding balance at the end of each month.
- The interest rate to be used will be 2% per month.
  Maxine sells the booklets for R23,00 each.

3.1 Use this information to complete the statement of the loan up to the end of March 2010 (you need only complete the missing values in the loan statement found in Annexure A below):

Date	Transaction	Debit	Credit	Balance
	Opening balance	—	—	R5 000,00
01 Feb 2010	Payment of printing invoice	–R13 000,00	—	–R8 000,00
20 Feb 2010	Sales of 50 booklets			
28 Feb 2010	Interest on loan account			
25 Mar 2010	Sales of 150 booklets			
31 Mar 2010	Interest on loan account			
28 Apr 2010				
30 Apr 2010				

(12)

3.2 How many booklets must she sell in April if she wants to settle the loan before the end of April? (3)

3.3 How many more booklets must Maxine sell before she breaks even? (4)

[19]

QUESTION 4

In his budget address on 17 February 2010 Minister Gordhan announced the following tax rates for the tax year ending 28 February 2011:

TAXABLE INCOME			RATES OF TAX		
R0	–	R140 000		+18% of each R1	
R140 001	–	R221 000	R25 200	+25% of the amount over	R140 000
R221 001	–	R305 000	R45 450	+30% of the amount over	R221 000
R305 001	–	R431 000	R70 650	+35% of the amount over	R305 000
R431 001	–	R552 000	R114 750	+38% of the amount over	R431 000
R552 000	and above		R160 730	+40% of the amount over	R552 000

- Rebates:
  - Primary rebate R8 280
  - Additional rebate for persons 65 years or older R4 680
- Tax threshold:
  - Persons under 65 years R46 000
  - Persons 65 years or older R74 000

4.1 Answer the following questions based on the information provided:

4.1.1 What is the tax threshold for a person under 65 years of age? (2)

4.1.2 What is the rebate for a person who is 72 years old? (2)

4.2 Show by calculation that the total tax payable by a 21-year-old person who earns R95 000 taxable income per annum is R8 820. (5)

4.3 Consider a 35-year-old person who earns R350 000 taxable income per annum.

4.3.1 Calculate the total tax payable by the person. (5)

4.3.2 Hence, calculate the effective tax rate for this person. (3)

[17]

QUESTION 5

Malaria is a preventable infection that can be fatal if left untreated. People travelling to countries where malaria is endemic are advised to take preventative medicine. Malarone is one type of malaria medicine. The dosage instructions for Malarone are as follows:

- Treatment with Malarone should be started 1 day before entering a malaria-endemic area and continued daily during the stay and for 7 days after return.
- Adults: One Malarone tablet (adult strength) per day.
- Children: The dosage for children is based on body weight:
  - 11 kg–20 kg: 1 pediatric tablet daily
  - 21 kg–30 kg: 2 pediatric tablets daily
  - 31 kg–40 kg: 3 pediatric tablets daily
  - > 40 kg: 1 adult strength tablet daily.

5.1 Answer the following questions based on the information provided:

5.1.1 How many days before the visit should medication be started? (2)

5.1.2 For how many days after the visit should medication be continued? (2)

5.1.3. How many pediatric tablets should a child that weighs 25 kg take daily? (2)

5.2 An adult is going on a 10-day trip to a country where malaria is endemic. Show that the adult will need a total of 18 tablets. (4)

5.3 A family consisting of 2 adults and 2 children (weighing 18 kg and 36 kg respectively) is going on an 8-day trip to a country where malaria is endemic.

5.3.1 Calculate the total number of adult tablets needed. (5)

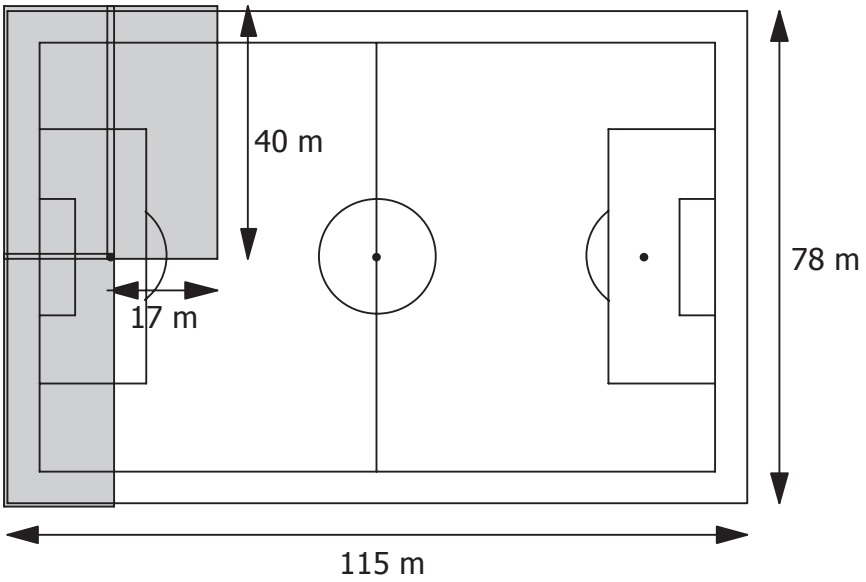
5.3.2 Calculate the total number of pediatric tablets needed. (6)

5.3.3 If the adult tables cost R12,00 each and the pediatric tablets cost R8,00 each calculate the total cost of the medication for the family for their trip. (3)

[24]

QUESTION 6

The soccer pitch and surroundings of the World Cup stadium to be used in the opening ceremony is 115 m long and 78 m wide. In order to protect the pitch from damage during the opening ceremony it will have to be covered with a large sheet of plastic. The plastic sheeting that will be used to make the cover is sold in rolls that measure 40 m × 17 m. The sheets are joined together so that they overlap by 1 m.



6.1 Show that joining two rolls of the plastic along the short ends will create a sheet that is 79 m × 17 m, which is long enough to cover the pitch and surroundings from one side line to the other. (5)

6.2 Calculate how many such strips are needed to cover the length of the pitch. Be sure to show your working. (6)

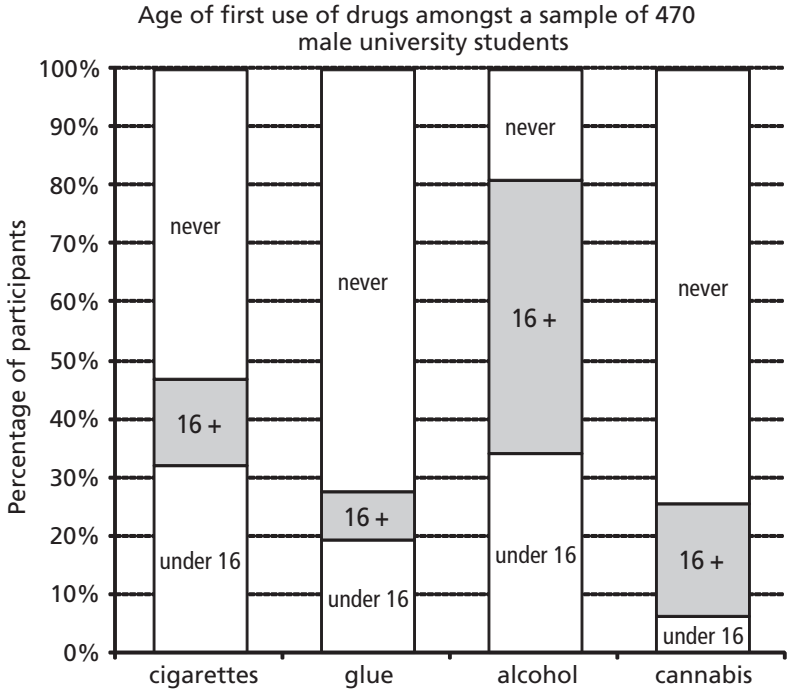
6.3 Based on the calculations above show that 16 rolls of plastic will be needed. (2)

6.4 By calculating the actual area to be covered and the actual area of the plastic bought, determine the percentage of extra plastic purchased. (6)

[19]

QUESTION 7

470 male university students participated in a survey asking them at what age they started using different substances. The results of the survey are summarised in the graph below.



7.1 Answer the following questions based on the graph:

7.1.1 What substances were the respondents asked about? (2)

7.1.2 What percentage of the respondents had started using cigarettes under the age of 16? (2)

7.1.3 What percentage of the respondents had never used cannabis? (2)

7.2 Calculate (to the nearest 10) the number of respondents who started using alcohol after they were 16 years old. (5)

7.3 Is it possible to say from the graph that there were respondents who had never used any of the substances in their life? Justify your answer. (4)

[15]