



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2011

MATHEMATICAL LITERACY: PAPER I

Time: 3 hours

150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 7 pages and FIVE questions, and an Answer Booklet of 2 pages (i – ii). Please make sure that your question paper is complete. Answer ALL the questions.
 2. Questions 3.4, 3.5 and 5.8 to be completed in the Answer Booklet provided.
 3. Number the answers exactly as the questions are numbered.
 4. An approved calculator (non-programmable and non-graphical) may be used.
 5. ALL necessary calculations must be clearly shown.
 6. ALL the final answers must be rounded off to TWO decimal places, unless stated otherwise.
 7. Units of measurement must be indicated where applicable.
 8. Write neatly and legibly.
-

QUESTION 1

1.1 Calculate:

1.1.1 $\frac{2}{7}$ of R3,56. (2)

1.1.2 $\sqrt{a^2 + b^2}$, if $a = 5$ and $b = 3$. (3)

1.2 Divide R500 between two people, in the ratio of 5:7. (4)

1.3 A radio bought for R160 is sold for R200. Calculate the percentage profit. (3)

1.4 Lesego uses 150 g of flour to bake 12 cupcakes. How much flour will she need to bake 24 cupcakes? (2)

1.5 On a scale drawing, 12 cm represents 48 m. Calculate how many metres 1 cm would represent in real life. (3)

1.6 A pair of shoes is marked at R175. It is on sale at 10% off the marked price. Calculate the new price of the pair of shoes. (2)

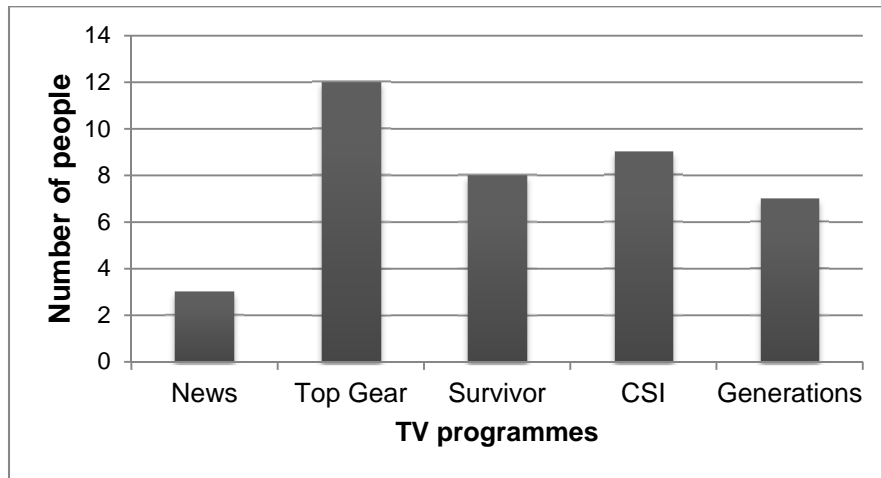
1.7 The following is an exchange rate table from a travel agent's office:

	1 GBP (£) =
USD (\$)	1,82
Euro (€)	1,43

1.7.1 Mr Dlamini is travelling to New York. He changes £750 to US dollars (\$). How much will he receive? (2)

1.7.2 A French company is buying goods in the UK. They exchange 2 000 Euros (€) into GB pounds (£). Calculate, to the nearest pound, how much they will receive. (3)

1.8 A survey was conducted asking people to name their favourite TV programme. The results are shown in the chart below:



- 1.8.1 Which programme was the most popular? (1)
- 1.8.2 Calculate the range of the people's favourite TV programmes. (2)
- 1.8.3 How many people took part in the survey? (2)
- 1.8.4 If a person was chosen at random, what is the probability that he/she will choose *Generations* as his/her favourite programme? (2)

1.9 Tishi has a collection of 237 DVDs. He bought boxes in which to store his DVDs. Each box can hold 42 DVDs.

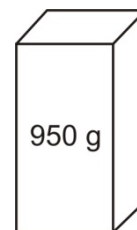
- 1.9.1 How many boxes will he need to store his collection? (2)
- 1.9.2 How many more DVDs could fit into the box that is not completely full? (2)
- 1.9.3 A box costs R49.95, excluding VAT (Value added Tax) of 14%. How much will his boxes cost, including VAT, if he only buys enough boxes for his collection? (4)

1.10 The cereal Chocó-Nuts is available in two possible box sizes:

450 g – R18,50



950 g – R28,50



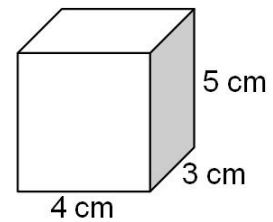
- 1.10.1 Calculate the cost of 50 g of Chocó-Nuts when bought in the 450 g box. (3)
- 1.10.2 Calculate which box size will be a better buy. Show all necessary calculations to justify your answer. (3)

[45]

QUESTION 2

2.1 A wooden building block has the following dimensions:

- width = 3 cm
- length = 4 cm
- height = 5 cm



Volume = length × breadth × height

2.1.1 Calculate the volume of one building block. (2)

2.1.2 The blocks are packed away in a box, with the following dimensions:

- width = 80 cm
- length = 60 cm

The blocks fit exactly into the box. Calculate how many blocks can fit onto the bottom of the box. (4)

2.2 The table below shows the distances, in miles, between four cities:

London			
3 460	New York		
570	3 960	Berlin	
6 010	7 800	5 980	Cape Town

2.2.1 Determine the distance, in miles, that a pilot would cover from London to New York. (1)

2.2.2 If 1 mile = 1,6 km, what total distance would a pilot cover in kilometers, from New York to London and then to Cape Town? (3)

2.2.3 A pilot flies from London to Berlin in 57 minutes. How many miles per minute was the plane travelling at?

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} \quad (3)$$

2.2.4 Another pilot left London at 17:45 and arrived in Berlin at 19:13. How long did the flight take? (2)

2.3 Clint buys a laptop for R3 999. He signs a hire purchase agreement that stipulates charges of 15% p.a. simple interest and an insurance fee of R30 be paid monthly.

Formula: $A = P(1 + i.n)$ where

- A = final amount
- P = principal amount invested
- i = the interest rate as a decimal
- n = the number of years

Calculate:

2.3.1 His monthly payments over the 3 year period. (4)

2.3.2 The total amount he will have paid at the end of the 3 years. (2)

[21]

QUESTION 3

As part of a fundraising drive at a school, the school's cricket team decide to sell cricket T-shirts to the local community.

The formula to calculate the cost of ordering and printing of pictures on the T-shirts is given as follows:

$$C = 40k + 330$$

Where C = total cost of the T-shirts purchased in Rands and
 k = number of T-shirts

3.1 How much does it cost the school to produce 10 T-shirts? (2)

The school decides to sell the T-shirts at R120 each.

3.2 Calculate the profit they would make if they sold 10 T-shirts. (3)

3.3 Copy and complete the following table in your Answer Booklet: (10)

Number of T-shirts	0	5	15	20	25
Cost of T-shirts $C = 40k + 330$		R530	R930		R1 330
Money earned from selling the T-shirts $C = 120k$	0		R1 800		

3.4 Use the values in the table above to plot two straight line graphs on the set of axes provided in the Answer Booklet. (9)

3.5 On the graphs drawn, indicate with the letter **A**, the point at which the school's fundraising committee will break even. (2)

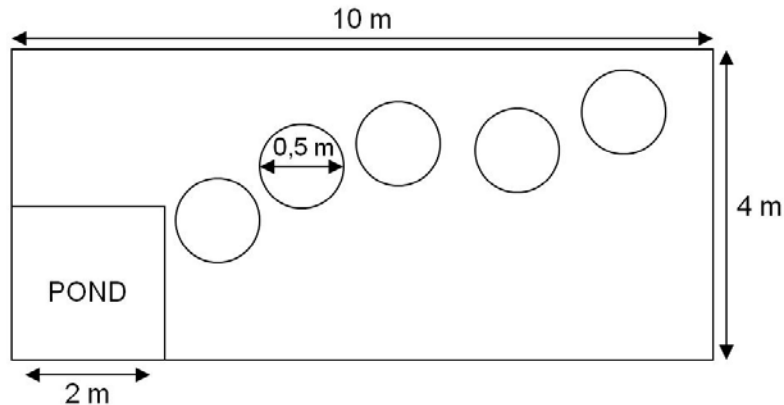
3.6 Use your graph to determine the school's profit after selling 18 T-shirts. (2)

[28]

QUESTION 4

The Grade 12s of 2011 of a certain school are designing a new rectangular garden as a farewell gift for their school when they matriculate. The garden will consist of a square pond at one end, and circular stone tiles forming a walkway to the pond. The area surrounding the pond and walkway will be grassed.

The design of the garden is indicated below:



Formulae you may need:

Area of circle = $\pi \times r^2$ where r = radius and $\pi = 3,14$

Area of square = $S \times S$ where S = side

Volume = $L \times B \times H$ where L = Length, H = Height and B = Breadth

- 4.1 The Grade 12 committee needs to order the stone tiles and grass for the new garden.
 - 4.1.1 Calculate the area that one circular stone tile will cover. (3)
 - 4.1.2 Calculate the number of square metres of grass that will need to be ordered from the local nursery for the garden. (5)
 - 4.1.3 If the cost of grass is R25 per $\frac{1}{2}$ m², calculate the cost of the grass for the new garden. (3)
- 4.2 The pond at the bottom of the garden will be filled with Koi fish. According to the local fish shop the pond should be at least 150 cm deep.
 - 4.2.1 Calculate the volume of the pond in cubic metres (m³). (4)
 - 4.2.2 If 1 m³ = 1 000 litres, how much water will be needed to fill the pond to 90% of its capacity? (3)
 - 4.2.3 The local fish shop recommends that for every 200 litres of water you have two Koi fish. What is the maximum number of fish that may be ordered for the pond? (3)
 - 4.2.4 Waterproofing paint will be needed to paint the interior of the fish pond. If 1 litre of paint covers 10 m², how many litres will be needed to waterproof the pond? The pond only needs one coat of paint. (3)

4.3 The garden will need to be watered for one hour a week. To save money they decide to get a rainwater tank. The water tank will supply 20 litres of water per minute.

How much water, in litres, will the garden receive once a week from the tank? (3)
[27]

QUESTION 5

In February 2007, a large-scale community survey (CS) was conducted in all of the provinces.

The main objective of the survey was to provide data for the municipalities.

The survey results showed that the population of South Africa increased from 44,8 million in 2001 to 48,5 million in 2007.

5.1 Write down the population of South Africa in 2007 in scientific notation. (2)

The **percentages** of households by province that have access to **piped water** are represented in the table below:

	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Limpopo	Mpumalanga	Northern Cape	North West	Western Cape
Survey 2001	63,2	95,7	97,1	72,5	78,1	85,7	93,9	86,6	98,3
Community Survey (CS) 2007	70,4	97,5	97,9	79,4	83,6	91,3	94,8	89,9	98,9

5.2 Which province had the greatest increase in access to piped water from the 2001 survey to CS 2007? (2)

5.3 Which province had the least amount of increase in access to piped water from the 2001 survey to CS 2007? (2)

5.4 Determine the **mean** of the data for the CS 2007. (3)

5.5 Arrange the percentages for the 2001 Survey in descending order. (2)

5.6 Determine the **range** of the data for the 2001 survey. (3)

5.7 If 135 482 people living in Gauteng participated in the CS of 2007, how many people, to the nearest whole number, have access to running water in Gauteng according to the CS of 2007? (4)

5.8 Draw a suitable compound bar graph on the axes provided in the Answer Booklet to represent the information in the above table. (11)
[29]

Total: 150 marks