



**higher education
& training**

**Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA**

NATIONAL CERTIFICATE (VOCATIONAL)

**MATHEMATICAL LITERACY
(Second Paper)
NQF LEVEL 3**

NOVEMBER 2012

(10401023)

**6 November (X-Paper)
09:00 – 12:00**

Drawing instruments may be used.

Calculators may be used.

This question paper consists of 11 pages and 1 annexure.



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TIME: 3 HOURS
MARKS: 150

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Clearly show ALL calculations, diagrams, graphs, et cetera you have used in determining the answers.
5. Drawing instruments including rulers, pairs of compasses and protractors may be used.
6. Diagrams are not necessarily drawn to scale.
7. Write neatly and legibly.



QUESTION 1

- 1.1 A local building contractor studies the increase in building materials costs in the previous three consecutive years.

The contractor wants to use this information to determine the increase in labour cost for 2010.

Given below is the TABLE that shows the price increase of building materials between 2007 and 2009.

Use the information given above and in the TABLE to answer the questions.

Item	2007	2008	2009	% Price increase 2008 – 2009	% Price increase over 3 years
A bag of cement	R52,50	R58,00	R69,75	A	32,86%
20 litre of paint	R199,95	R238,95	B	17,18%	40,04%
TD75 steel window	R250,00	R250,00	R300,00	20,00%	20,00%
A ton of sand	R180,00	R230,00	R350,00	52,17%	94,44%
Floor tiles/square metre	R45,95	R44,95	R54,95	22,25%	19,59%
A pallet of bricks	R750,00	R850,00	R1050	23,53%	40,00%

- 1.1.1 Use calculations to prove that the price of cement increased by 32,86% over three years.

$$\text{Formula: Percentage change} = \frac{\text{current price} - \text{previous price}}{\text{previous price}} \times 100\% \quad (3)$$

- 1.1.2 Explain why the % price increase over three years for floor tiles is less than that of 2008 – 2009. (2)

- 1.1.3 Study the TABLE above and determine the value of:

(a) A (3)

(b) B (3)

- 1.1.4 Calculate the mean price percentage increase over three years. (3)

- 1.1.5 The contractor used the mean price percentage increase in materials for 2008 – 2009 to increase the labour costs for 2010.

If the contractor charges R27 000,00 for labour cost in 2009, calculate the new labour cost in 2010. (5)

- 1.2 In 2011 the restaurant owner made a profit of R21 500 and she decided to invest R10 000 in a fixed deposit. Given below is the bank statement for the month of June 2012.

Capital Bank Investments			
Statement VAT Reg. No: 432 011 6070			
Mrs ES Masobelle 13389 Mamelodi East	STATEMENT DATE 03/July/2012	ACCOUNT NO. 1120434781471	100 Main Street Johannesburg 2000
ACCOUNT SUMMARY			2000
Initial Investment		R 10 000. 00	
Current rate of Interest per annum/year		7.2%	
Date of initial investment		03 January 2012	PO Box 1133, Johannesburg, 2000
Life of fixed deposit		24 Months	
MONTH	OPENING BALANCE	INTEREST	CLOSING BALANCE
Jan 2012	R10 000	R60,00	R10 060
Feb 2012	R10 060	R60,36	R10 120,36
Mar 2012	R10 120,36	R60,72	R10 181,08
Apr 2012	R10 181,08	R61,09	R10 242,17
May 2012	R10 242,17	A	R10 303,62
Jun 2012	R10 303,62	R61,82	B

1.2.1 Prove that the monthly interest rate is 0,6%. (2)

1.2.2 For how many months will the money be invested? (1)

1.2.3 Show how the interest value of R60,00 at the end of January was calculated.

Formula: Interest = Opening Balance \times monthly interest rate

Note: Monthly interest rate = $\frac{0.6}{100}$ (3)

1.2.4 Show how the closing balance of R10 242,17 at the end of April was calculated. (2)

1.2.5 Calculate the following:

(a) The interest amount at the end of May, the value of A. (2)

(b) The closing balance of at the end of June, the value of B. (2)



1.2.6 Calculate the money that will be in the account at the end of the investment period at an interest rate of 7,2% and compounded annually.

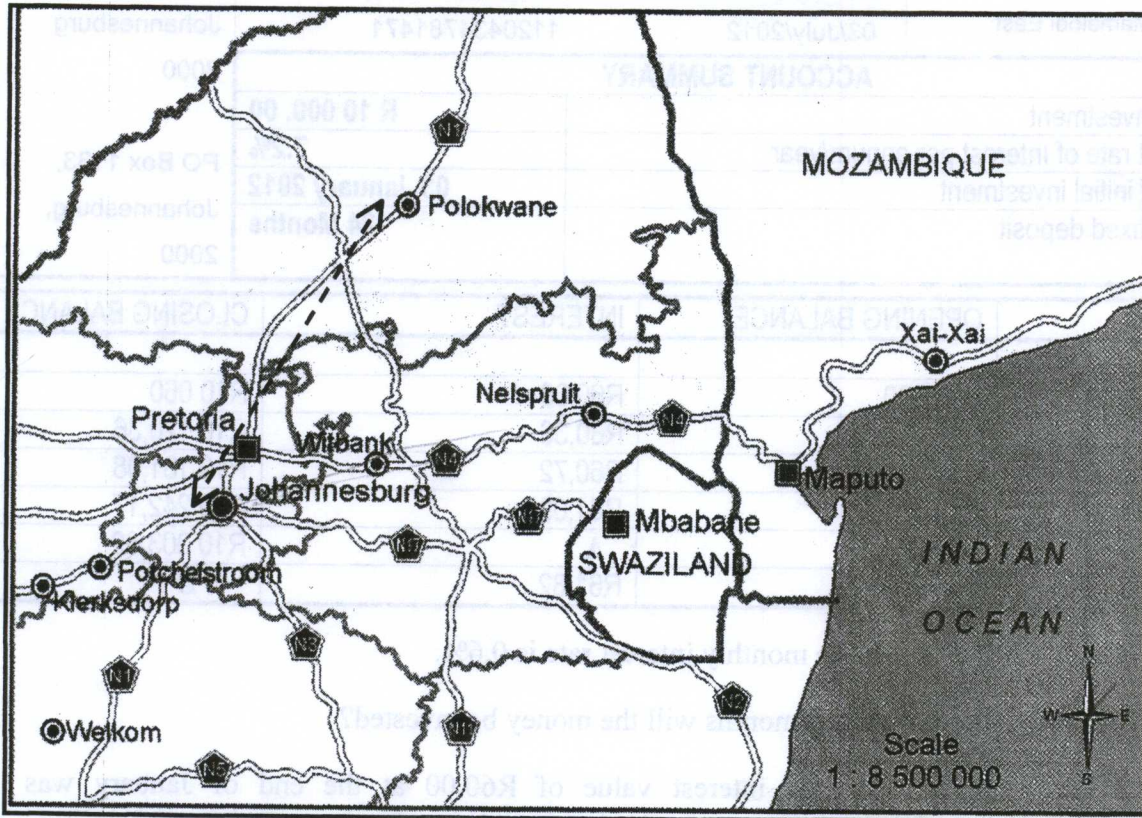
$A = P(1+i)^n$ where P = Principal amount

n = number of periods

i = interest rate

(4)

1.3 Study the map below and answer the questions.



1.3.1 Use the scale to show that 1 mm on the map is 8,5 km in actual distance. (2)

1.3.2 What is the compass direction if one travels from Johannesburg to Nelspruit? (2)

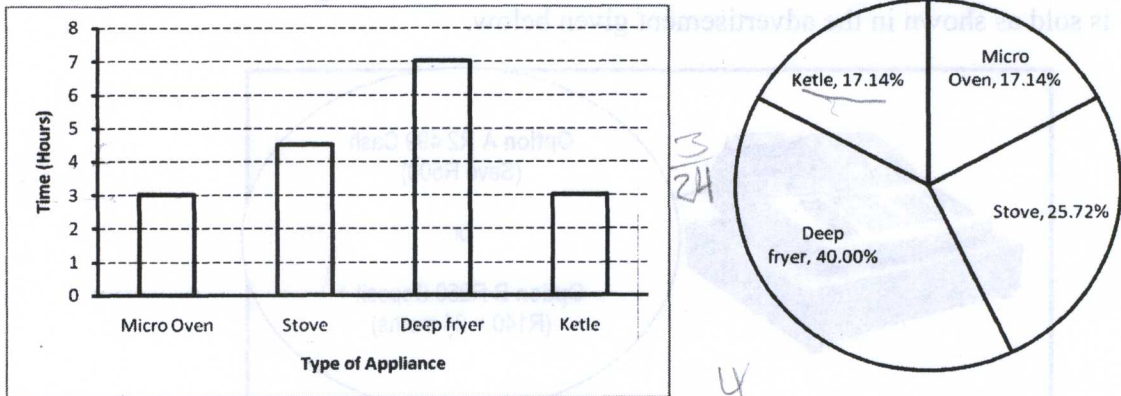
1.3.3 Use the map to determine the direct distance in kilometres when you fly from Johannesburg to Polokwane. (3)

1.3.4 Determine the distance in kilometres between Pretoria and Potchefstroom travelling by motorcar. Show ALL the steps. (3)

Handwritten calculations: $\frac{25}{1000}$ and $\frac{25}{1000}$



1.4 The bar graph and the pie chart given below show usage in hours per day by different types of electrical appliances in a small restaurant next to your college.



- 1.4.1 Write down a suitable title for these graphs. (2)
- 1.4.2 Show by means of simple calculation that a kettle represents 17,14% of usage. (2)
- 1.4.3 Identify the type of appliance missing in the pie chart and calculate its usage in percentage. (3)
- 1.4.4 Which of the two graphs best represents the usage of appliances in hours? Justify your answer. (3)
- 1.4.5 Does the appliance with more hours of usage means more electricity consumption? Answer 'yes' or 'no' and justify your answer. (3)

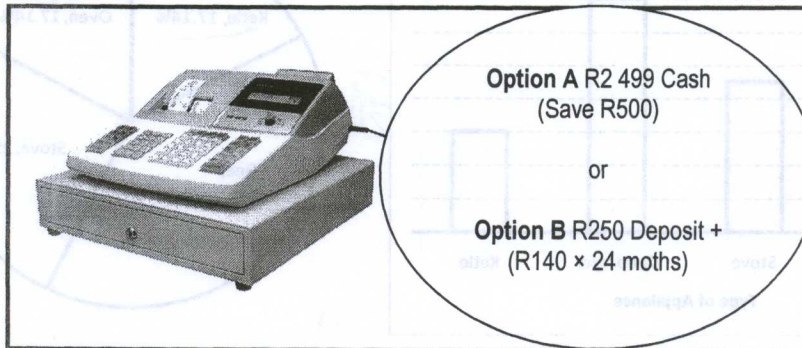
[58]

South African rand	Japanese yen	Euro	British pound	Bosnian pula	1 US\$
139	80.33	0.73	0.67	1.19	1 US\$



QUESTION 2

- 2.1 The owner of a small restaurant wants to purchase a cash register. The cash register is sold as shown in the advertisement given below.



Study the advertisement shown above and answer the questions.

- 2.1.1 What was the original cash price of the cash register before the sale? (2)
- 2.1.2 Calculate the discount as a percentage to the original cash price. (3)
- 2.1.3 Which is the better option, Option A or Option B? Use calculations to justify your answer. (3)
- 2.1.4 How much money will you save if you take the better option? (2)
- 2.2 Given below is a currency exchange rate table against US dollar. Study this TABLE and answer the questions.

American Dollar (\$)	1 US\$
Botswana pula	7,19
British pound	0,63
Euro	0,75
Japanese yen	80,52
South African rand	7,59

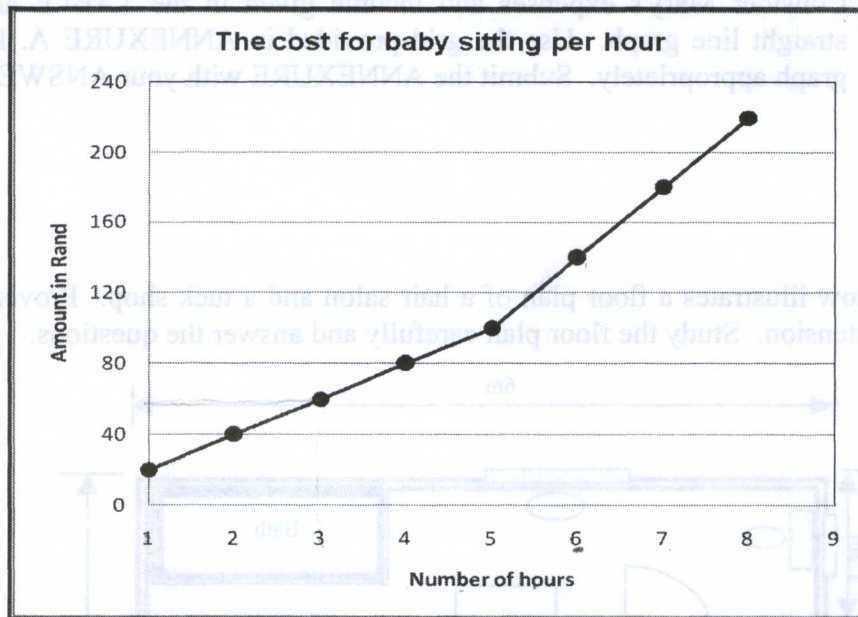
- 2.2.1 1US\$ = R _____ (1)
- 2.2.2 Convert R2 499 to US\$. (2)
- 2.2.3 Convert R2 499 to Botswana Pula. (3)
- 2.2.4 The same cash register was advertised in the USA on the internet for 300US\$. The shipment will cost 30US\$ and it takes a minimum of three weeks to be delivered.
- Use the currency exchange rate table and calculate the total cost in rand to import the cash register from the USA to South Africa. (4)
- 2.2.5 'It is better for the restaurant owner to purchase the cash register in the USA.' Do you agree or disagree with the statement? Justify your answer. (3)

[23]

QUESTION 3

Mary works as a babysitter at a local casino. She charges the amount of R20,00 per child for the first five hours and double the amount for five hours thereafter. Mary pays a rent of R200,00 per day for performing her duties at the casino.

The graph below shows the hourly rate per child of a babysitter at a local casino. Use the graph to answer the questions.



- 3.1 How much will Mary earn after three hours of babysitting one child? (2)
- 3.2 How much will Mary earn after babysitting three children for three hours? (2)
- 3.3 At which hour does the graph change? (2)
- 3.4 Choose the correct statement: The reason for the change in the graph is:
 - The scale change on the axis
 - The rate per hour has doubled after five hours
 - The rate per hour has decreased after five hours
 (2)
- 3.5 How much does she charge per child per hour beyond five hours of babysitting? (2)
- 3.6 How much will Mary earn after babysitting two children for six consecutive hours? (4)
- 3.7 Write down the formula that Mary will use to calculate her income. (3)
- 3.8 Use any method to calculate how many children will she have to babysit in order to make R240,00 in the first three hours. (3)



3.9 The TABLE below shows Mary's income after babysitting three children for consecutive hours in one day. Mary also pays a rent of R200,00 per day to the casino.

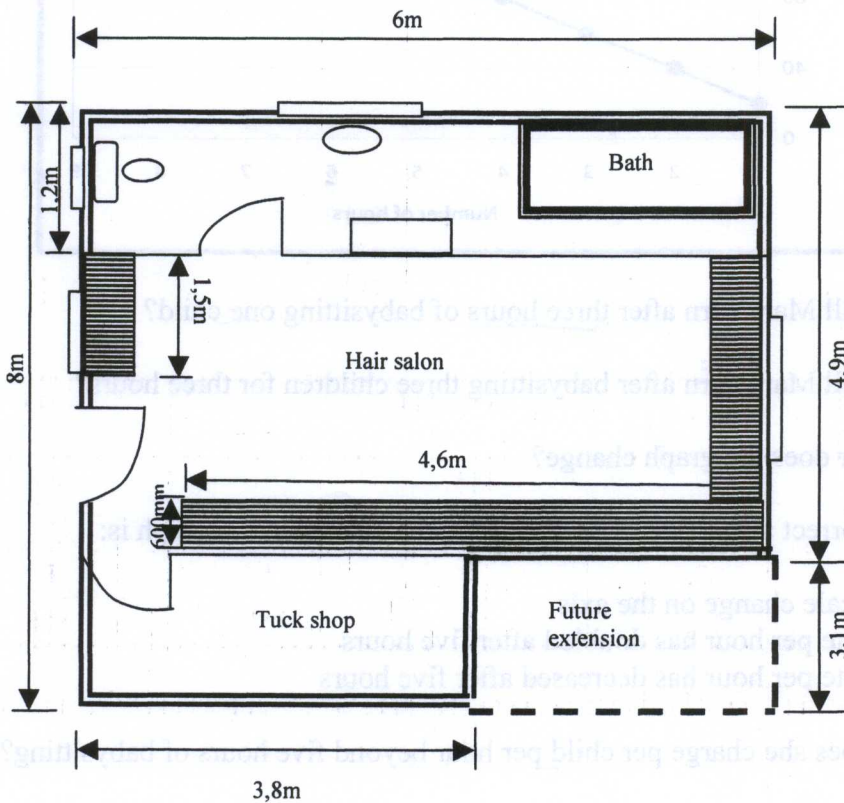
Hours	1	2	3	4	5	6	7	8
Income in rand	60	120	180	240	300	420	540	660 A

3.9.1 Use any method to calculate the missing value of A in the TABLE. (2)

3.9.2 Consider Mary's expenses and income given in the TABLE and draw a straight line graph. Use the grid provided in ANNEXURE A. Label your graph appropriately. Submit the ANNEXURE with your ANSWER BOOK. (4) [26]

QUESTION 4

The floor plan below illustrates a floor plan of a hair salon and a tuck shop. Provision is also made for future extension. Study the floor plan carefully and answer the questions.



4.1 Determine the length and the breadth of the space for future extension. (3)

4.2 Calculate the area for future extension. Area = Length × Breadth (2)



- 4.3 Mary wants to tile the floor in the tuck shop. The tiles are only sold in boxes of 10 tiles. The area of the tuck shop is 11,78 m².

$$\frac{400}{10}$$

$$\frac{11,78}{0,16}$$

Each tile is square and has the following dimensions: length and breadth of 400 mm.

0,16 m

- 4.3.1 Convert the dimensions of a tile from mm to m. (2)
- 4.3.2 Calculate the area of a tile in m². (2)
- 4.3.3 How many boxes of tiles are required to tile the tuck shop? (6)
- 4.3.4 Is it necessary to add 5% additional tiles to allow for breakage? Answer 'yes' or 'no' and justify your answer. (3)
- 4.3.5 Calculate the cost to tile the entire tuck shop if a box of tiles costs R99,00 and labour is charged at R60 per m². (4)

[22]

QUESTION 5

In a study on a number of accidents in one year and the age of the driver, 500 drivers were randomly chosen between the ages of 18 and 50 and questioned.

Given below is the contingency table that is showing the results of the study. Study the TABLE and answer the questions.

Number of accidents	Age of driver			Total
	18 – 25	26 – 40	41 – 50	
0	75	115	110	300
1	50	A	35	150
2	25	20	5	B 50
Total	C	200	150	500

- 5.1 Determine the number of drivers between the ages of 26 and 40 and had one accident, the value of A. (2)
- 5.2 Determine the total number of drivers who had two accidents, the value of B. (2)
- 5.3 Determine the total number of drivers who were between the ages of 18 and 25, the value of C. (2)



- 5.4 Determine the probability if chosen at random:
 - 5.4.1 A driver who is between the ages of 41 and 50 (2)
 - 5.4.2 A driver who is between the ages of 26 and 40 and had one accident (2)
 - 5.4.3 A driver who is accident free in the age group 18 – 25 (2)
 - 5.5 Which age group are better drivers? Justify your answer by using simple calculations. (3)
 - 5.6 Describe the trend in accident involvement of the age group 18 – 25 drivers. (2)
 - 5.7 Consider only drivers who were involved in two accidents and draw a bar graph. Use the grid provided in ANNEXURE A. Label your graph appropriately. Submit the ANNEXURE with your ANSWER BOOK. (4)
- TOTAL: 150**

Total	Age of driver			Number of accidents
	41 – 50	26 – 40	18 – 25	
300	110	112	78	0
120	32	4	20	1
8	2	20	22	2
300	150	200	120	Total

- 2.1 Determine the number of drivers between the ages of 26 and 40 and had one accident. the value of A. (2)
- 2.2 Determine the total number of drivers who had two accidents, the value of B. (2)
- 2.3 Determine the total number of drivers who were between the ages of 18 and 25, the value of C. (2)

