higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY
(Second Paper)
NQF LEVEL 3

NOVEMBER 2011

(10401023)

10 November (X-Paper)
09:00 – 12:00

This question paper consists of 10 pages and 2 annexures.

TIME: 3 HOURS
MARKS: 150

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL questions carefully.
3. Number the answers according to the numbering system used in this question paper
4. Clearly show ALL the calculations, diagrams, graphs, etc 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 After Peter's spaza shop was closed down he left R50,00 in his savings account. The bank is offering an annual interest of 1,5% compounded monthly.

1.1.1 If he left the R50,00 for five years in the savings account, calculate the current value of the investment.

Formula:

$A = P(1+i)^n$

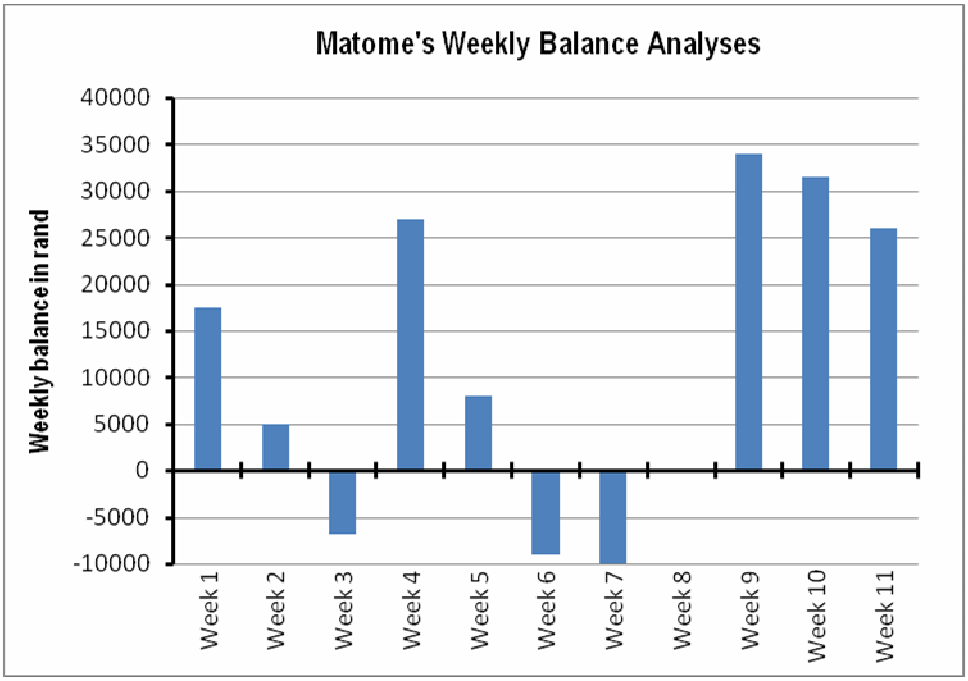
Where A = Final amount, P = Principal amount, i = interest rate and n = number of periods. (4)

1.1.2 The bank withdraws R1,20 of bank charges every month from his account. Calculate the value of the bank charges Peter paid for 5 years. (3)

1.1.3 At the end of the 5-year period, the money in Peter's account probably would have increased. If you agree or disagree with this statement, give reasons for your answer. (4)

1.2 Matome runs a Multichoice and Top TV installations company in his area. The graph below shows the weekly balance analysis of his bank account. Matome is also allowed to access an overdraft of R10 000 from his account.

Study the graph and answer the questions that follow.



1.2.1 Determine the following from the graph:

(a) What was the balance in the account at the end of week 2? (2)

(b) What was the balance in the account at the end of week 6? (2)

(c) On how many weeks was the account in overdraft? State the weeks. (2)

1.2.2 How much money could Matome still withdraw from his account at the end of week 5? (2)

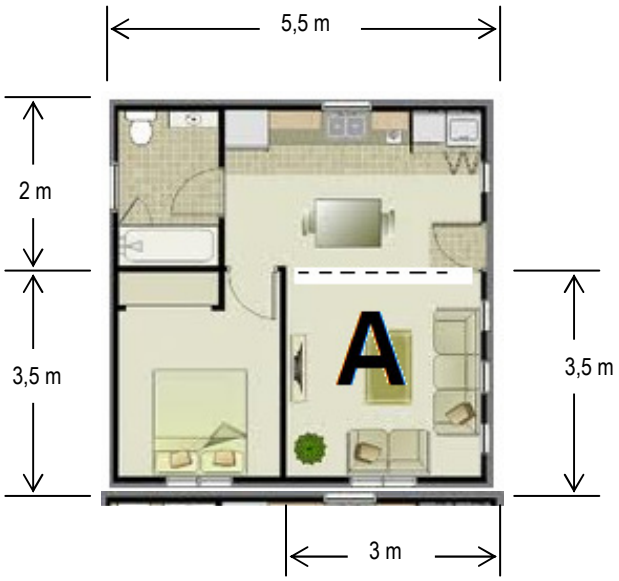
1.2.3 Explain what was happening at the end of week 8. (2)

1.2.4 Describe in overall terms what happened between the following pairs of weeks to account for the change in the bank balance: (2)

(a) Week 2 to week 3.

(b) Week 8 to week 9. (2)

1.3 Kobus is in a business of selling and renting out property such as houses, town houses and flats. Given below is a floor plan of a one bedroom flat he is about to rent out to a tenant.



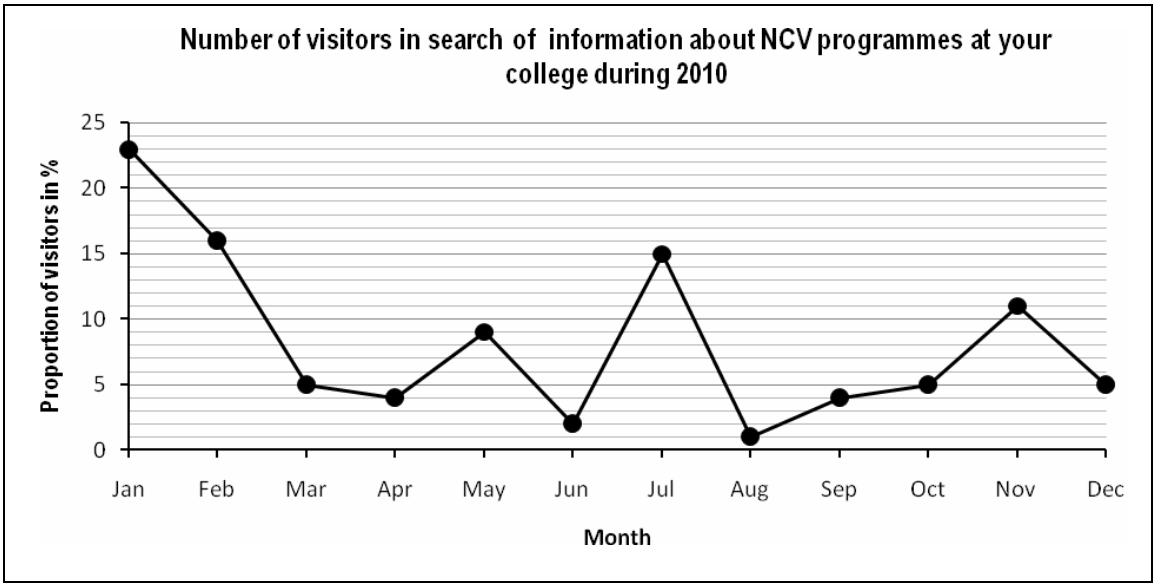
1.3.1 Calculate the total area of the flat. (3)

1.3.2 If rent is charged at R80/m^2 plus a monthly fixed levy of R250 for routine maintenance, determine the monthly rent that Kobus will receive from a new tenant. (4)

1.3.3 The new tenant wants the living room **marked A** to be carpeted first. Calculate the amount of carpet required in m^2. (3)

1.3.4 If the carpet costs R35/m^2 and labour is charged at R20/m^2, determine the total cost to carpet the living room. (5)

1.4 The graph below shows the proportion of the annual total visitors in search of information about NCV programmes at your FET college during 2010. Study the graph and answer the questions that follow.



1.4.1 During which period (three consecutive months) were visits declining? (3)

1.4.2 What was the percentage number of visitors during the month of May? (2)

1.4.3 During which month was the percentage number of visitors 11%? (2)

1.4.4 If the total number of visitors was 4 020, calculate the number of visitors during the month of October. (3)

1.4.5 Calculate the mean percentage of visitors per month. (4)

1.4.6 Determine the median by using the percentage number of visitors during the twelve-month period. (3)

1.4.7 Explain why the college had more visitors during January and February. (2)

[59]

QUESTION 2

2.1 Ayanda is running a taxi business in her local area. She charges R5,50 per person for every kilometre travelled. The table below shows the travelling cost per person in relation to the distance in km travelled with one of her taxis. Use the table and answer the questions that follow.

AYANDA'S TAXI COST PER KM									
Distance in km	0	10	20	30	40	50	**B**	70	80
Travelling cost in rand (Ayanda's taxi)	0	55	110	**A**	220	275	330	385	440

2.1.1 Determine the values of A and B. (4)

2.1.2 Write a formula (equation) that you can use to calculate the cost per person in relation to the distance travelled. (2)

2.1.3 Use the formula to calculate the travelling cost per person with one of Ayanda's taxis, if 33 km were travelled. (2)

2.2 John is also running a taxi business in his local area. He charges a basic fee of R40,00 per person and R4,50 for every kilometre travelled. The table below shows the travelling cost per person in relation to the distance in km travelled with one of his taxis.

Formula: Cost = R40 + (R4,50 × n), where n = distance in kilometres.

JOHN'S TAXI COST PER KM									
Distance in km	0	10	20	30	40	50	60	70	80
Travelling cost in rand (John's taxi)	40	85	130	175	220	265	310	355	400

2.2.1 Calculate the travelling cost per person with one of John's taxis, if 33 km were travelled. (2)

2.2.2 Calculate the distance travelled, if the travelling cost for a person was R535. (3)

2.3 A graph of Ayanda's taxi cost per person is drawn on ANNEXURE A. Use the information given in the table of John's taxi cost per km to draw a graph on the same system of axis. Label the graph. (5)

2.4 Analyse the statements given below. State whether you Agree/Disagree and give reasons for your answers.

2.4.1 It is cheaper to use Ayanda's meter taxi if only 20 km is to be travelled. (2)

2.4.2 It is cheaper to use John's meter taxi if only 40 km is to be travelled. (2)

2.5 Which of the two taxis will you choose if you have to travel for 90 km? Give ONE reason for your choice. (2)

[24]

QUESTION 3

Mrs. Ndala received her electricity bill of her trading store for the month of August 2010. Study the electricity bill as shown below and answer the questions that follow.

MARBLE HALL MUNICIPALITY
13 Ficus Street, MARBLE **HALL**.
Tel: (013) 261 8400

PO Box 111
MARBLE HALL
0450

Account No.	**Account Date:**	**Enquiries**	**Fax**
00156784	31/08/2011	(013) 261 8400/1	0866129875
Name	**Erf No**	**Location**	**Type of Dwelling**
Mrs. Dipuo Ndala	213A	Marble Hall	Trading Store

Date	**Details**	**Tariff/kWh**	**Charge**	**VAT (14%)**	**Amount**
28/07/2011	**ELECTRICITY CONSUMPTION**: Reading in July 2011: **376 912 kWh** Consumption in July: **901kWh**	R0,78	R702,78	R98,39	R801,17
31/08/2011	Reading in August 2011: **377 912 kWh** Current consumption: **(3.1.1)**	R0,78	**(3.1.2)**	**3.1.3)**	**(3.1.4)**
31/08	Ampere – 30 AMP	R1,10/AMP	R33,00	R4,62	**(3.1.5)**

90 Days+	**60 Days**	**30 Days**	**Current**	**Total Due**
0,00	0,00	0,00		**(3.1.6)**
Pay by due date to avoid disconnection/Restriction.			**Final date for payment**	
			30/09/2011	

3.1 Do NOT copy the table, only determine the values of (3.1.1 – 3.1.6) and show ALL the calculations.

3.1.1 The current consumption for the month of August 2011. (3)

3.1.2 The charge of the August 2011 bill.
Formula: Charge = Tariff × current consumption (2)

3.1.3 The VAT (Value Added Tax) at 14% on the charge for the current consumption. (2)

3.1.4 The amount owed for electricity consumption for August 2011.
Formula: Amount = Charge + VAT (2)

3.1.5 The amount owed for ampere charge for a 30 Amp circuit breaker.
Formula: Amount owed = Ampere charge + VAT (2)

3.1.6 The total due for August 2011. (2)

3.2 The percentage (%) increase in electricity usage (kWh) since July 2011. (4)

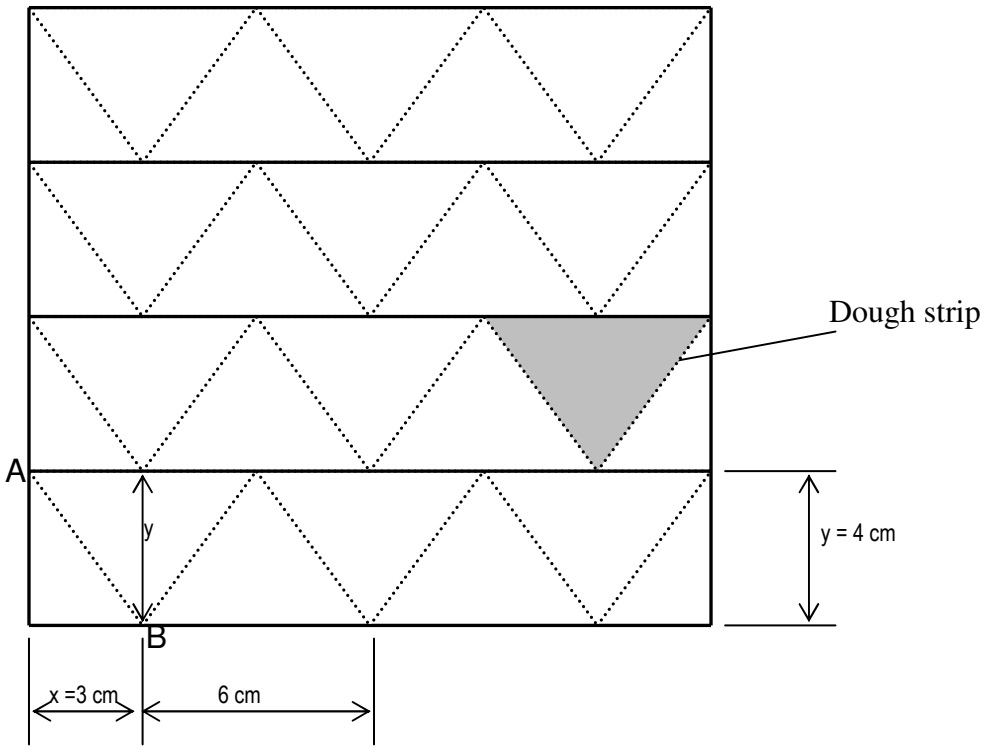
3.3 Determine closing meter reading for June 2011. (3)

3.4 Why can Mrs Ndala be regarded as a responsible homeowner? (2)
[22]

QUESTION 4

Rashid has to develop and construct a stainless steel cake cutter to cut the dough for samoosas as shown below.

Given below is the top view (diagram) of the cake cutter with dimensions. Study the diagram and answer the questions that follow:



4.1 Prove that the side of the samoosa, marked AB in the diagram equals 5 cm.

$AB = \sqrt{x^2 + y^2}$ (3)

4.2 Determine the perimeter of each dough strip. (3)

4.3 Calculate the area of a single dough strip.

Area of triangle = $\frac{1}{2} \times base \times height$ (3)

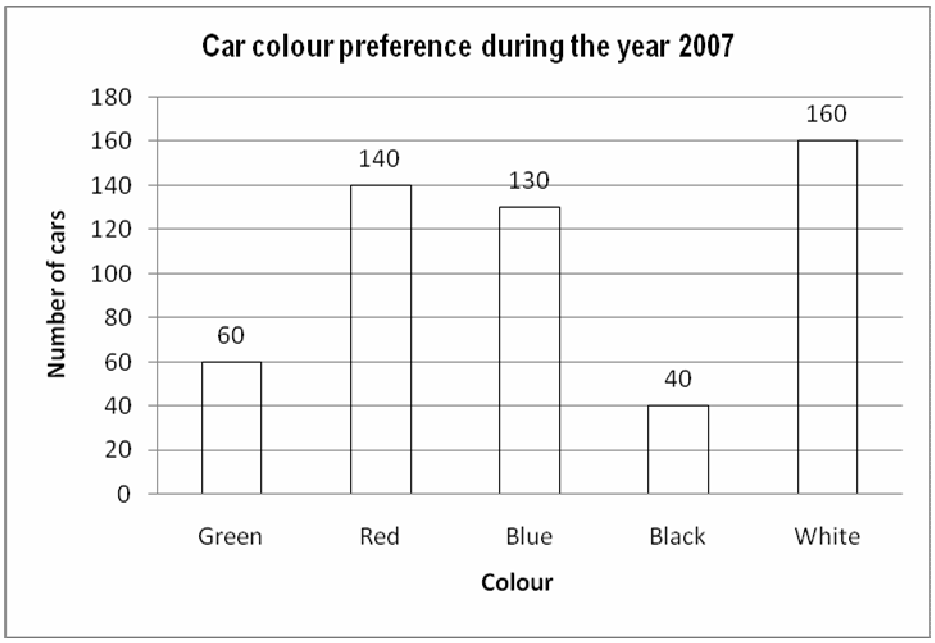
4.4 Use the diagram to calculate the dough wasted during the process of making 20 samoosas. Give THE answer in cm^2. (7)

4.5 Do you think that the waste calculated in 4.4 can be thrown away? Yes or No. Use calculations to justify your answer. (4)

[20]

QUESTION 5

The graph below shows the results of a survey on car colour preferences during the year 2007. Study the graph and answer the questions that follow.



5.1 Describe the outcome of the survey with reference to the two extremes in preference. (2)

5.2 Determine the car colour that represents the median by using the number of cars per colour. (2)

5.3 Determine the range with reference to the number of cars per colour. (2)

5.4 How many colours of cars were included and what was the sample size of the survey? (3)

5.5 What is the probability of a green colour being preferred during 2007? (3)

5.6 Shaun claims that the probability of preferring a yellow car is very low. Is his claim valid or invalid? Justify your choice. (3)

5.7 Convert the information given in the graph to percentages and complete and label the pie chart given in ANNEXURE B. (10)

[25]

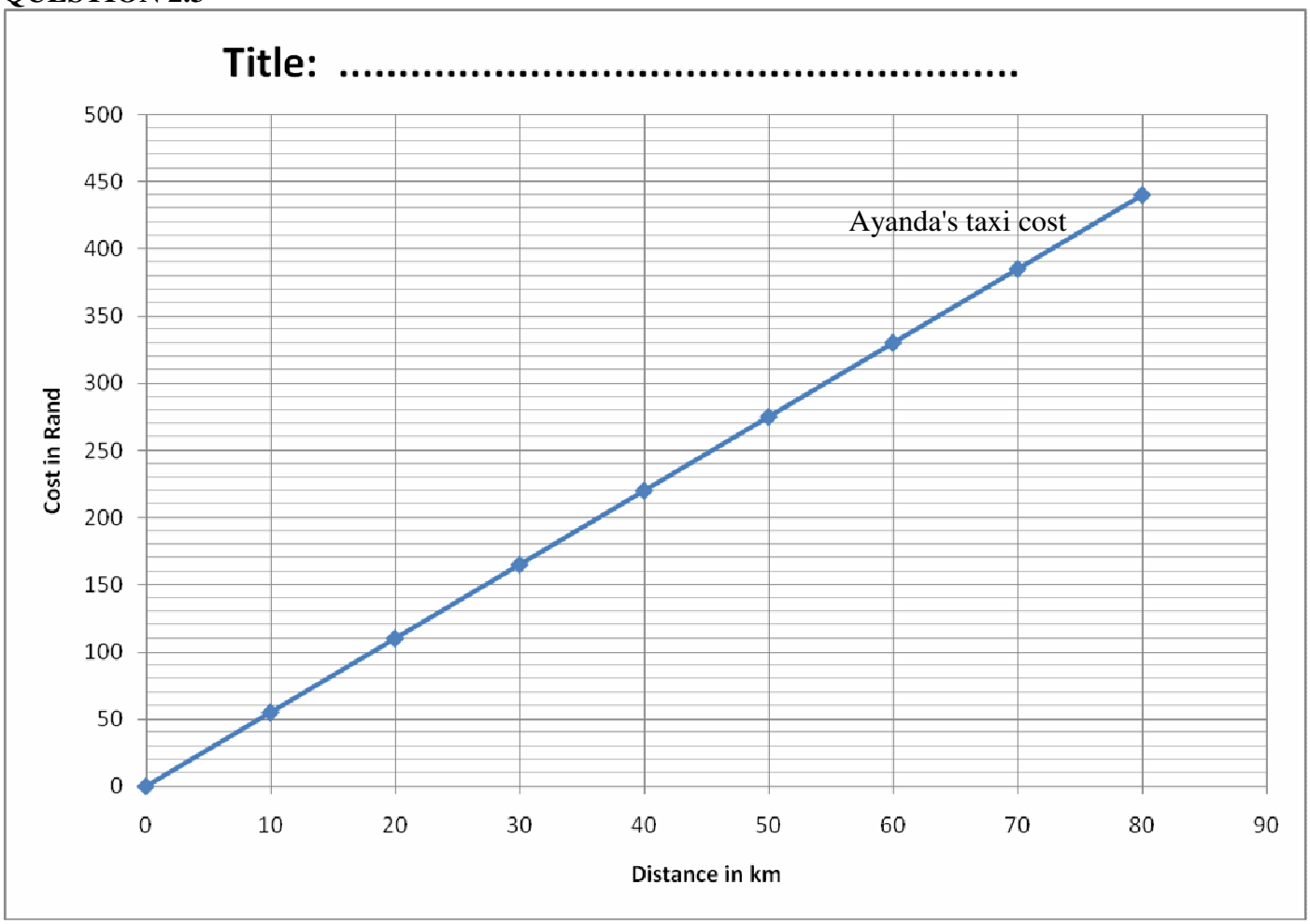
TOTAL: 150

ANSWER SHEET
ANNEXURE A

Examination Number										**Centre Number**		**9**	**9**	**9**	**9**				

Complete and submit with your ANSWER BOOK.

QUESTION 2.3



ANSWER SHEET
ANNEXURE B

Examination Number											**Centre Number**		**9**	**9**	**9**	**9**				

Complete and submit with your ANSWER BOOK.