



GRADE 10 EXEMPLAR EXAMINATION
NOVEMBER 2006

MATHEMATICS LITERACY
PAPER 1

Minimum time: 1 ½ hours
Maximum time: 2 hours

75 marks

PLEASE READ THE FOLLOWING CAREFULLY

1. This paper consists of:
 - 5 questions
 - an answer sheet with grid paper for question 4 (d).
 2. Answer all the questions.
 3. Calculators may be used in all questions.
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QUESTION 1: BANKING WITH BONGANI

Bongani has a *savings account* with *i-Moocha Moola Bank*. Every month he receives a bank statement from the bank outlining the transactions on the account during the month.

Below is the bank statement for Bongani’s savings account for the month of February. (20)

i-MOOCHA MOOLA BANK

Bank Statement

Account Name: Mr. Bongani Dlamini	Account Number: 3178 2100 415
Type of account: Savings	Details of account holder: PO Box 1345, Hilton, 3245 Tel: (033) 317 5128

Transaction Date	Transaction Details	Transaction Amount	Account Balance
01 Feb	Opening Balance		R5 158,90
01 Feb	Stop Order: Rent	-R2 300,00	R2 858,90
01 Feb	Service Fee	-R9,00	R2 849,90
05 Feb	Withdrawal: ATM	-R600,00	R2 249,90
05 Feb	Service Fee		R2 245,90
09 Feb	Cash Deposit	R148,70	
09 Feb	Service Fee	-R3,41	R2 391,19
15 Feb	Cash Withdrawal: Branch	-R1 800,00	R591,19
15 Feb	Service Fee	-R37,10	R554,09
25 Feb	Cash Deposit: Salary	R4 140,20	R4 694,29
25 Feb	Service Fee	-R41,33	R4 652,96
28 Feb	Cash Withdrawal: Branch	-R2 200,00	R2 452,96
28 Feb	Service Fee	-40,90	R2 412,06
CLOSING BALANCE			R2 412,06

Amount in Savings Account	Interest Rate per Year
R1,00 – R999,00	1,5%
R1 000,00 – R9 999,99	1,8%
R10 000,00 – R19 999,99	2,5%
> R20 000,00	3,0%

Terminology:

- Savings account:* An account from which money can be withdrawn or into which money can be deposited at any time during the month.
- Opening Balance:* The amount of money in the account at the beginning of the month before any transactions are made on the account.
- Withdrawal:* Money taken out of the account.
- Deposit:* Money put into the account.
- Branch:* A cash withdrawal or cash deposit at the branch is a withdrawal or deposit that is made over the counter inside a bank with a bank teller.

Stop Order:	A Stop Order is an instruction to the bank to deduct a fixed amount of money from a person's account every month and then to pay this money to someone else.
ATM:	An ATM is an Automated Teller Machine. ATMs are usually found outside a bank and enable you to draw money from or deposit money into your account without having to go into the bank.
Service fee:	An amount deducted by the bank for each transaction made on the account.
Interest:	Interest is the reward that a bank will pay its clients for investing money with the bank.
Interest rate:	This is the rate (expressed as a percentage) at which a person is rewarded for money that has been invested in the bank.

- (a) (i) Why do some of the values in the Transaction Amount column have minus signs in front of them? (1)
- (ii) How much money was in the account on 18 February? (1)
- (b) (i) Calculate the missing Service Fee for 5 February. (1)
- (ii) Calculate the missing Account Balance for 9 February. (1)
- (c) Bongani sees in an *i-Moocha Moola Bank* brochure that the service fee for withdrawing money from a savings account at an *i-Moocha Moola Bank* branch is calculated using the formula:

$$\text{Service fee} = \text{R}20,00 + 0,95\% \text{ of the amount withdrawn}$$

Bongani decides to use the formula to see how the service fee for the withdrawal made on 15 February was calculated, but he makes several mistakes and ends up with the wrong answer. Below are his calculations.

$$\begin{aligned} \text{Service fee} &= \text{R}20,00 + 0,95\% \text{ of R}1\ 800,00 \\ &= \text{R}20,00 + 0,095 \times \text{R}1\ 800,00 \\ &= \text{R}20,095 \times \text{R}1\ 800,00 \\ &= \text{R}36,17 \end{aligned}$$

- (i) Explain where Bongani has made mistakes in his calculations. (3)
- (ii) Show that the service fee of R37,10 given on the bank statement is correct. (2)
- (d) (i) If the *i-Moocha Moola* bank calculates interest monthly, calculate the *monthly rate* at which interest will be calculated on the money in Bongani's account. (1)
- (ii) If the *i-Moocha Moola* bank calculates interest monthly, calculate how much interest Bongani will earn on the closing balance of R2 361,58 in February. (2)
- (iii) Compare the interest that Bongani earns on the money in his account to the total amount that he pays in service fees for the month and make a deduction about whether Bongani is making or losing money by keeping his money in a bank account. (2)
- (iv) Why do you think people keep their money in bank accounts? (1)
- (e) The table below shows the transaction fees for money deposited into and withdrawn from a *Big-Bucks Bank* savings account.

- (b) The price of the shirt that Penny bought on 5 June has been left off the summary. Use the pie chart to show that this shirt cost R135,49. (3)
- (c) (i) If Penny does not pay the amount due on the account by the due date, how much interest will she have to pay on the money that she owes? (2)
- (ii) If Penny only pays the account on 29 September, how much will she have to pay to *Small Joe's Clothing Company* to settle the account? (5)

13 marks

QUESTION 3: MANDLA'S MONEY

Below is a budget of Mandla's income and expenditure for the month of September.

Mandla's Budget – September	
Income:	
Salary	R7 150,50
Present from Dad	R350,00
Expenditure:	
Groceries: food	R2 880,00
Clothes	R920,00
Car repayments	R1 650,00
Toiletries	R165,30
Entertainment	R750,00
Eating out	R680,25
Petrol	R715,50

Terminology:

Car repayments: When Mandla bought a car he took a out a loan from a bank to buy the car. The monthly car repayments are the repayments that Mandla makes to the bank each month to pay off the car loan.

- (a) Is Mandla in a good or poor financial position? You must show your working. (3)
- (b) With reference to the budget above, make two suggestions as to how Mandla could improve his financial position. (2)

5 marks

QUESTION 4: BOB THE BUSINESSMAN’S CELLPHONE DILEMMA

Bob the businessman is wanting to buy a new cellphone. He finds the following two cell phone adverts in the newspaper.

Mala-Mala Cells

Buy the Honchorola 814 cellphone for only R745,00 on pre-paid.



No monthly subscription

El-Cheapo Cells

Apply for a new contract and receive a Pokia 1302 cell phone free.



Terminology:

Pre-Paid

Most cellphone companies offer two different options – “Pre-paid” or “Contract”. On the Pre-paid option (sometimes referred to as Pay-As-You-Go), you buy the phone and install phone cards to be able to make calls. The phone belongs to you and you can only make calls if there is enough money on the phone card in your phone.

Contract

With the contract option you “buy” the phone from the cellphone company by paying them a fixed amount of money each month (called a *subscription fee*), and then you receive a bill at the end of each month for the calls that you have made.

Peak & Off-Peak Time:

Irrespective of whether you choose the Pre-paid option or the Contract, the cost of a call on a cellphone depends on whether that call is made during Peak or Off-Peak time. From 7am to 8pm is peak time and calls are charged at a higher rate. From 8pm until 7am is off-peak time, and calls are charged at a cheaper rate.

Free Minutes:

With some contracts the cellphone companies offer “Free Minutes”. This allows the user of the cellphone to make a certain number of minutes of free calls.

- (a) The table below contains the call charges for the *Mala-Mala Cells* pre-paid option and the *El-Cheapo Cells* contract option. All calls are charged per minute.

	Mala-Mala Pre-Paid			El-Cheapo Contract		
	Monthly Subscription	Peak Time	Off-Peak Time	Monthly subscription	Peak Time	Off-Peak Time
Calls to cellphones	None	R2,80	R1,60	R75,00	R2,10	R1,20
SMS		R0,85	R0,35		R0,50	R0,25
Calls to landline phones		R3,25	R2,00		R2,80	R1,40

- (i) Calculate how much it will cost to make a 5-minute phone call during peak time to another cellphone on the *Mala-Mala* pre-paid option. (1)
- (ii) Calculate the cost of a 12,5 minute call (excluding subscription fee) from a cellphone on the *El-Cheapo* contract option to a landline phone during off-peak time. (1)
- (b)
- (i) Write down an equation to represent the total monthly cost of being on the *Mala-Mala* pre-paid option if all calls are made to other cellphones during peak time. (1)
- (ii) Write down an equation to represent the total monthly cost of being on the *El-Cheapo* contract option if all calls are made to other cellphones during peak time. (1)
- (c) Use the formulas that you constructed in (b) or any other method to calculate the missing values in the table below.

	Mala-Mala Pre-Paid Option	El-Cheapo Contract Option
Time (minutes)	Monthly Cost	Monthly Cost
0	R0,00	R75,00
10	R28,00	R96,00
20	R56,00	R117,00
30	R84,00	R138,00
40	i)	R159,00
50	R140,00	R180,00
60	R168,00	R201,00
70	R196,00	R222,00
80	R224,00	ii)
90	R252,00	R264,00
...
iii)	iv)	R327,00

- (5)
- (d) Use the set of axes given on the last page of the exam to draw graphs to show the total monthly cost of calls on the *Mala-Mala* pre-paid option and the *El-Cheapo* contract option. (4)
- (e) Use the graphs that you have drawn to answer the following questions:
- (i) Approximately how much will it cost to make 65 minutes worth of calls on the *Mala-Mala* pre-paid option? (1)

- (ii) Approximately how many minutes worth of calls have you made on the *El-Cheapo* contract option if you receive a bill of R270,00? (1)
- (iii) If Bob the businessman makes approximately 3 hours worth of calls per month and makes most of his calls during peak time, should he choose the *Mala-Mala* pre-paid option or the *El-Cheapo* contract option? Explain your answer. (2)
- (iv) If the pre-paid option also included 30 *free* minutes of off-peak talk time, do you think this would change which option Bob will choose? Explain. (2)

19 marks

QUESTION 5: WASEEMA’S WATER COSTS

Waseema lives in Johannesburg and receives the brochure from the *Johannesburg Municipality* outlining the water tariffs for the year.

Johannesburg Municipality

Water Tariffs 2006

Consumption (kilolitres)	Tariff (per k)
0 to 6 kl	Free
6,1 to 10 kl	3.90
10,1 to 15 kl	5.15
15,1 to 20 kl	6.45
20,1 to 40 kl	7.75
Greater than 40 kl	9.15

If you use 12 kl of water you can calculate your water consumption costs in the following way:

- The first 6 kl are free.
- The next 4 kl are charged at a rate of R3,90 per kl
- The next 2 kl are charged at a rate of R5,15

\therefore *Cost of water consumption* = $(R0,00 \times 6 \text{ kl}) + (R3,90 \times 4 \text{ kl}) + (R5,15 \times 2 \text{ kl})$
 = R0,00 + R15,60 + R10,30
 = R25,90

Terminology:

Kilolitre: Water is measured in kilolitres (kl)
 1000 litres = 1 kl

Consumption: Amount of water used during the month

Tariff: The rate at which residents are charged for the water they use

- (a) The calculation $R0,00 \times 6 \text{ kl}$ appears in the example of how to calculate water consumption costs given on the brochure. What does this calculation represent? (1)

- (b) Calculate the cost of consuming 14 kl of water. (3)
- (c) Waseema’s brother lives in the *eThekwini Municipality*. In this municipality, residents are charged both a fixed monthly charge and a charge per kl.

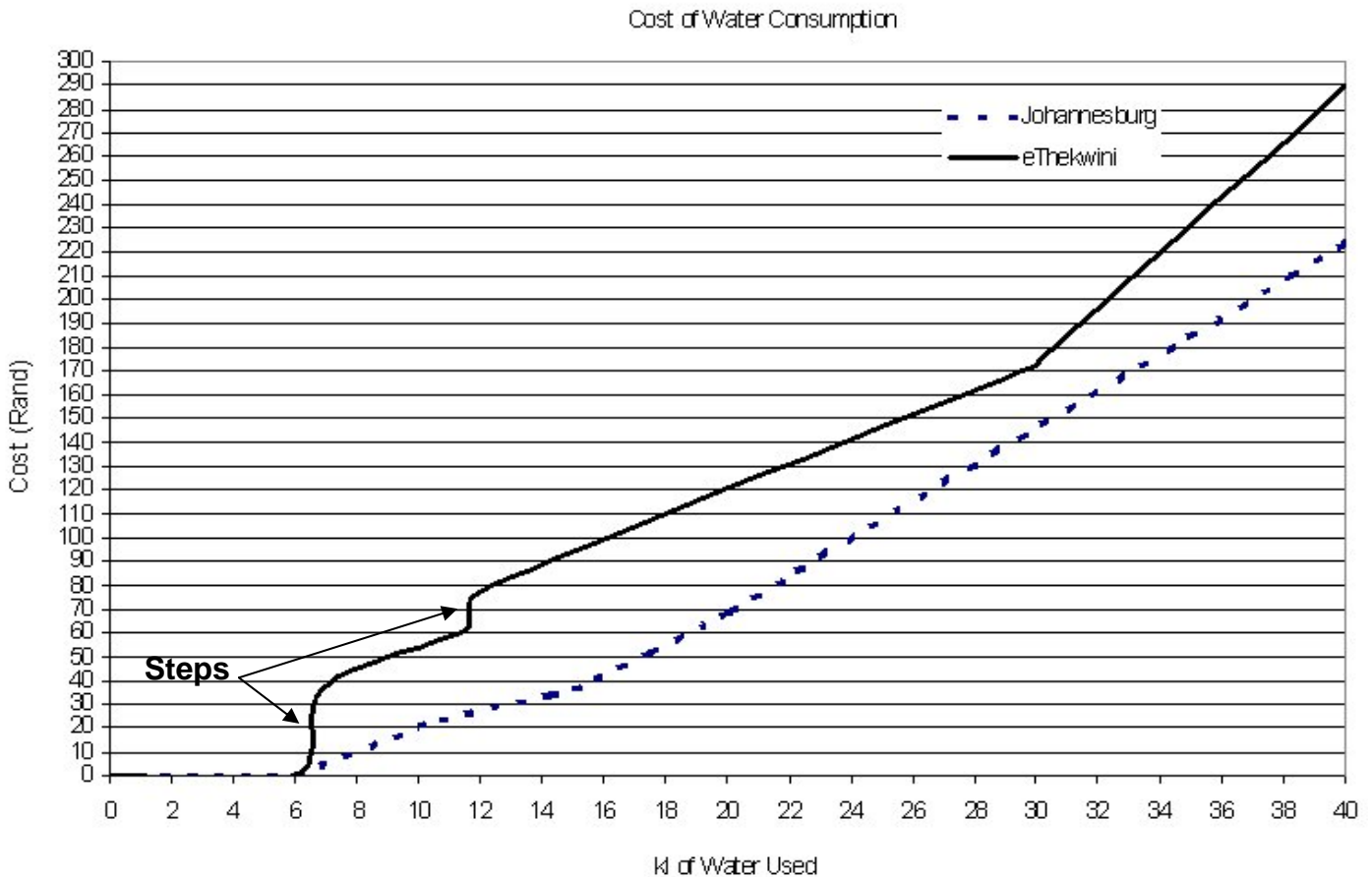
The table below shows the water tariffs and the formula used for calculating water costs in the *eThekwini Municipality*.

Tariff Structure for Water Consumption in the <i>eThekwini Municipality</i>*	
Total monthly water cost = fixed charge + charge per kl of water used	
Charge per kl	
Consumption (kilolitres)	Tariff (per kl)
0 to 6 kl	Free
6,1 to 30 kl	R5,30
more than 30 kl	R11,66
Fixed charge per month	
Consumption (kilolitres)	Tariff
0 to 6 kl	Free
6,1 to 11,9 kl	R31,80
≥ 12 kl	R45,49

If Waseema and her brother used 9,5 kl of water in a month, use the tables above to determine:

- who will pay more for their water consumption?
 - how much more they will pay? (5)
- (d) The graphs below show the cost of water in the *Johannesburg Municipality* and in the *eThekwini Municipality*.

* Source: www.durban.gov.za/eThekwini (April 2006). The *eThekwini Municipality* incorporates Durban and surrounding areas.



- (i) Do residents in Durban or Johannesburg pay more for their water, assuming that they use more than 6 kl of water? Explain your answer. (2)
- (ii) Why do the graphs “lie on top of each other” for the first 6 kl of water used? (1)
- (iii) Approximately how much water have you used if you receive a water bill of R45,50 from the *Johannesburg Municipality*? (1)
- (iv) There are *steps* at various places on both of the graphs (for example, at point A). Why are the graphs “stepped”? (1)
- (e) If the *eThekweni Municipality* stopped charging a fixed monthly charge and only charged per kl of water used, would this change whether residents in Durban pay more or less for their water than residents in Johannesburg? Explain your answer. (4)

18 marks