



education

Department:
Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

MATHEMATICAL LITERACY P2

EXEMPLAR PAPER 2008

MARKS: 150

TIME: 3 hours

This question paper consists of 14 pages and 3 Annexures

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer all the questions.
2. Questions 1.1, 3.2 and 4.2.1 must be answered on the attached Annexures. Write your name/examination number in the space provided and hand in the Annexures with your ANSWER BOOK.
3. Number the questions correctly according to the numbering system used in this question paper.
4. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
5. ALL the calculations must be shown clearly.
6. ALL the final answers must be rounded off to TWO decimal places, unless stated otherwise.
7. Start each question on a NEW page.
8. Write neatly and legibly.

DRAFT

QUESTION 1

- 1.1 The South African Revenue Service (SARS) is responsible for collecting taxes from taxpayers on behalf of the government.

As the Government requires money on an ongoing basis to fund services such as education, health, security and welfare, every employer must deduct PAYE from their employee's salaries and pay it over to SARS every month.

Once a year, every employee who earns more than R60 000 per annum has to complete a tax form listing their income received and their allowable deductions for the tax year beginning on 1 March of one year and ending on the last day of February of the following year. The 2007 assessment year began on 1 March 2006 and ended on 28 February 2007.

At the end of a tax year, an employer has to give each employee an IRP 5 certificate. The IRP 5 Certificate lists the total employment income earned by an employee as well as the total PAYE taxes that were deducted by the employer and paid to SARS.

Patsy Smith works in the sales department of United Industries. She earns R10 560,00 per month. From her salary she pays a monthly contribution to a pension scheme and to a medical aid fund.

Every month her employers deduct employee's tax from her salary in the form of PAYE (Pay-As-You-Earn).

TABLE 1: Patsy Smith's Pay Slip for January 2007

UNITED INDUSTRIES	PAY DATE: 24-JAN-07	NAME: Patsy Smith	STAFF NUMBER 099-0045	DEPARTMENT Sales
IDENTITY NUMBER 691112-0041-085	BIRTH DATE 12-11-1969	JOB TITLE Sales Person	TAX REFERENCE NUMBER 192837465	
STATUS Single	BANK ACCOUNT NUMBER 963 246 987		BANK/BUILDING SOCIETY BCTB	
EARNINGS	AMOUNT	DEDUCTIONS	AMOUNT	
Basic Salary	R10 560,00	Pension (7,5% of monthly salary)	R792,00	
		Medical Aid Contribution	R495,00	
		Pay-As-You-Earn (PAYE)	R1 918,77	
		Unemployment Fund (UIF)	R21,20	
TOTAL EARNING	R10 560,00	TOTAL DEDUCTIONS		
				NETT PAY DUE:

Patsy used TABLE 2 (which is given on ANNEXURE A and must be handed in with your answer book) to calculate whether she needed to pay more tax to SARS at the end of the 2006/2007 tax year, or whether they were going to give her a rebate (pay money back to her).

- 1.1.1 Patsy has R50 000 invested in a money-market account that gives her an interest rate of 7,2% per annum interest.

The interest earned is calculated using the formula

$$\text{Interest} = \text{Amount invested} \times \text{interest rate} \times \text{number of time periods}$$

- (a) Calculate the interest earned by Patsy during the 2006/2007 tax year from her investment in the money market account. Show all working. (2)
- (b) Fill in the interest earned next to the heading “Dividends from South African banks” on TABLE 2 (which is given on ANNEXURE A). (1)
- 1.1.2 Patsy earns R10 560,00 per month before deductions. In December each year Patsy receives a bonus of a 13th cheque. This 13th cheque consists of a month’s salary, but without pension fund or medical aid deductions having been taken from it.
- (a) On TABLE 2 fill in:
 (i) her Annual Salary before deductions (2)
 (ii) her Bonus. (1)
 Where necessary, show all working out on TABLE 2.
- (b) Calculate SUB-TOTAL A and fill in the amount on TABLE 2. (2)
- 1.1.3 Before the final tax payable is calculated, all medical aid contributions that are less than R500 per month and all pension fund contributions are deducted (taken off) the income received. As Patsy pays R495,00 per month for medical aid, she is able to deduct her full contribution before her final tax is calculated.
- Fill in the following on TABLE 2. Show all working out on TABLE 2.
- (a) Patsy’s annual medical aid contributions (2)
- (b) Patsy’s annual pension fund contributions (2)
- (c) SUB-TOTAL B (2)
- (d) Patsy’s Taxable Income (SUB-TOTAL A – SUB-TOTAL B) (2)

- 1.1.4 South Africa has a *Progressive Income Tax System*. This means that the more you earn, the more tax you pay. The tax rates sometimes vary from year to year. TABLE 3 shows the tax rates for the 2006/2007 tax year.

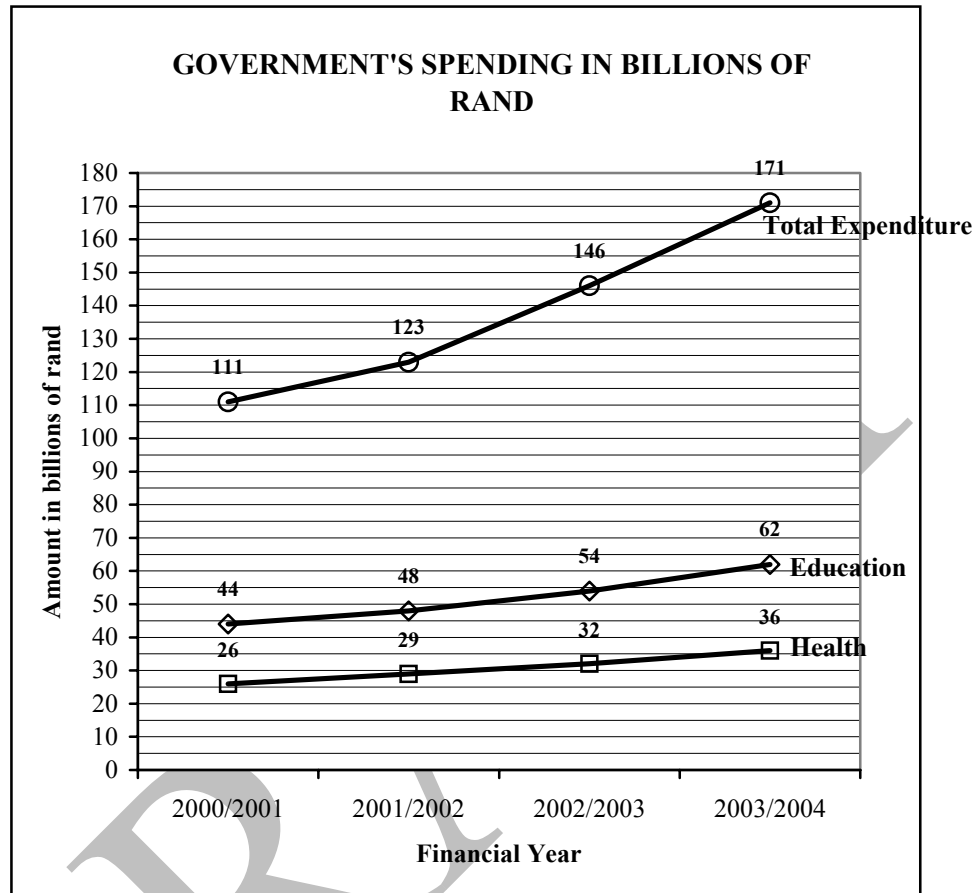
**TABLE 3: Tax rates for the year of assessment ending 28 February 07
(2006/2007 Year of Assessment):**

Taxable income	Rates of tax
R0 – R100 000	18% of each R1
R100 001 – R160 000	R18 000 + 25% of the amount above R100 000
R161 000 – R220 000	R33 000 + 30% of the amount above R160 000
R220 001 – R300 000	R51 000 + 35% of the amount above R220 000
R300 001 – R400 000	R79 000 + 38% of the amount above R300 000
R400 001 and above	R117 000 + 40% of the amount above R400 000

Fill in the following on TABLE 2. Show all working out on TABLE 2.

- (a) SUB-TOTAL C, the total tax payable on Patsy's Taxable Income. Use the rates on TABLE 3 to do the calculations. (4)
- (b) SUB-TOTAL D, the total PAYE contributions paid by Patsy's employers to SARS during the 2006/2007 tax year if she pays R1 918,77 per month PAYE. (4)
- (c) The total amount either payable by Patsy or owed to her by SARS. (2)

1.2 The following graph appeared in The Daily Voice newspaper in June 2005. It shows the Government’s spending in billions of rand on Social Security and Welfare Services, to which the Department of Education and the Department of Health (amongst others) belong.



stats in brief 2006, Statistics South Africa

- 1.2.1 (a) Calculate the percentage of the total expenditure that was spent on Education
- (i) in the 2000/2001 financial year (3)
 - (ii) in the 2003/2004 financial year (3)
- (b) Write down what you notice about your answer to QUESTION 1.2.1 (a) (2)
- 1.2.2 The newspaper headlines read “*Education and Health Still Being Neglected*”. Do you agree with this statement? Give reasons for your answer. (3)
- 1.2.3 Has spending on Education and on Health increased at the same rate? Explain how you reached your answer. (4)

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QUESTION 2

In 2007 the City of Johannesburg informed its residents that there would be a increase in the cost of the water that it supplied to households. (See TABLE 4.) Most water usage in South Africa is charged for on a sliding scale with the amount individual users pay for services charged for in proportion to their use of that service.

TABLE 4: Domestic Water Tariffs In Johannesburg For Dwellings Fitted With a Water Meter.

	<i>Kilolitres used per dwelling per month</i>	2006/2007 Cost per kℓ	2007/2008 Cost per kℓ
Categories	0 kℓ to 10 kℓ	Free	Free
	11 kℓ to 15 kℓ	R5,60	R5,90
	16 kℓ to 20 kℓ	R7,00	R7,40
	21 kℓ to 40 kℓ	R8,40	R8,80
	+ 40 kℓ	R9,90	R10,40

2.1 Between 2006/2007 and 2007/2008:

The percentage increase in cost for the category 11 kℓ to 15 kℓ was 5,36%.

The percentage increase in cost for the category 16 kℓ to 20 kℓ was 5,71%

Calculate the percentage increase in cost between 2006/2007 and 2007/2008 for the following categories:

2.1.1 21 kℓ to 40 kℓ (2)

2.1.2 + 40 kℓ (2)

2.2 Using the information in TABLE 4, we can calculate the cost in 2007/2008 of using 45 kℓ of water as follows:

$$45 \text{ kℓ} = 10 \text{ kℓ} + 5 \text{ kℓ} + 5 \text{ kℓ} + 20 \text{ kℓ} + 5 \text{ kℓ},$$

So the cost of using 45 ℓ of water in a month

$$= (10 \text{ kℓ} \times R0,00) + (5 \text{ kℓ} \times R5,90) + (5 \text{ kℓ} \times R7,40) + (10 \text{ kℓ} \times R8,80) + (5 \text{ kℓ} \times R10,40)$$

Use the formula above, to calculate the cost of using 45 kℓ of water per month in 2007/2008. (2)

- 2.3 Mr Ntuli and his family live in a house in Johannesburg. The family's water usage for the past year is shown in TABLE 5.

TABLE 5: Monthly Water Usage by the Ntuli household

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Consumption (in kℓ)	25	23	25	25	30	26	26	30	22	25	22	37

- 2.3.1 Calculate their average (mean) monthly water consumption (in kℓ), rounded off to 1 decimal place (3)
- 2.3.2 Use the costs given in TABLE 4 to calculate their average monthly payment for water in: (3)
- (a) 2006/2007 (3)
- (b) 2007/2008 (2)
- 2.3.3 Calculate the percentage increase between their average monthly payment in 2006/2007 and their average monthly payment in 2007/2008. (2)
- 2.4 In the middle of 2007, newspaper headlines announcing the increase in the cost of household water read "*Water Tariffs increased by an average of 5%*". (3)
- Were the headlines correct? Give reasons for your answer. (3)

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QUESTION 3

The Department of Health keeps records of the number of people affected by certain infectious diseases. Amongst these diseases are Hepatitis A, Cholera and Measles.

Hepatitis A is an infectious disease that affects the liver. It is spread through poor sanitation and poor hygienic conditions, most commonly through contaminated water and from person to person. Most infections occur during early childhood. Nearly all patients recover completely, with no long-term effects.

Cholera is an acute infection caused by bacteria. It is a water-borne disease, but it can also be transmitted by contaminated food. If patients are not treated, the disease can cause dehydration and, in some cases, death.

Measles is an extremely contagious viral disease. It is transmitted through contact with someone who either has measles or is getting measles. Measles can easily be prevented by vaccination.

The following table (TABLE 6) shows the prevalence of the three diseases in the nine provinces in 2003.

TABLE 6: PREVALENCE OF VARIOUS DISEASES IN SOUTH AFRICA IN 2003

	PROVINCES								
	EC	FS	GP	KZN	LP	MP	NC	NW	WC
Hepatitis A	7%	23%	1%	1%	3%	1%	8%	1%	66%
Cholera	80%	0%	0%	15%	0%	5%	0%	0%	0%
Measles	14%	1%	34%	1%	8%	21%	1%	17%	3%

3.1 In which province is the largest number of each of the following found?

3.1.1 Hepatitis A (1)

3.1.2 Cholera (1)

3.1.3 Measles (1)

3.2 Use the axes provided on ANNEXURE B to draw a compound bar graph showing the prevalence of the three diseases in each province.

Use shading and a key to indicate which bar represents which disease. (9)

[12]

QUESTION 4

4.1

The South African textile industry is currently facing extremely difficult conditions. Because clothing produced in some overseas countries can be sold for a cheaper price than clothing produced in South Africa, some local textile mills and clothing factories have been closed and their staff has been retrenched. The number of jobs in the industry has declined from 70 500 in 2003 to just below 50 500 in 2006.

In order to revitalise the textile industry in South Africa, the Government has introduced a limit on the number of clothing items been allowed into South Africa. (See TABLE 6)

TABLE 6: NUMBER OF CLOTHING ITEMS ALLOWED INTO SOUTH AFRICA

	2006	2007	2008
Knitted clothing (jerseys, sweaters)	113 496 000 items	74 907 000 items	81 666 000 items
Woven clothing (shirts, trousers, blouses, skirts)	140 395 000 items	101 084 000 items	109 931 000 items

4.1.1 One of the responsibilities of Government is to promote responsible trade.

(a) Calculate the percentage decline in the number of workers employed in the textile industry in South Africa from 2003 to 2006. (3)

(b) Calculate the percentage decrease in the number of woven clothing items imported into South Africa from 2006 to 2007. (3)

(c) Is the decision to decrease the number of woven clothing items allowed into South Africa justified? (2)
Give a reason for your answer.

4.1.2 In 2008, the government intends allowing more clothing imports into South Africa than in 2007.

(a) What is the difference between the number of knitted items allowed in 2007 and in 2008? (1)

(b) If the government decides to increase the number of knitted items by that amount each year, what will be the first year when the number of imported knitted items will be more than the number of knitted items imported in 2006? (6)

4.2

The Government is also encouraging small business entrepreneurs to venture into the clothing industry.

Phumzile Ngcobo purchased 12 industrial sewing machines when she was retrenched from a clothing factory in 2006. She opened a small business sewing T-shirts.

Phumzile buys fabric in bulk and does all the cutting out of the T-shirts herself. She employs her old workmates to sew the T-shirts.

The table below shows the number of workers needed and the time taken to sew 300 T-Shirts.

**TABLE 7: NUMBER OF WORKERS AND TIME TAKEN
TO SEW 300 T-SHIRTS**

Number of workers	1	2	3	4	6	10	12
Time taken in hours	300	150	100	75	50	30	25

- 4.2.1 Use the axes provided on ANNEXURE C to draw a graph to illustrate the data in TABLE 7. (4)
- 4.2.2 Write down a formula that shows the relationship between the number of workers needed to sew 300 T-shirts and the time taken to sew the T-shirts. (2)
- 4.2.3 If it takes one worker one hour to sew a T-shirt, how long would it take 6 workers to sew 1 800 T-shirts? (2)

[23]

QUESTION 5

5.1

All forty learners of Freedom Secondary School's Grade 12 C class decided to paint their classroom as a farewell gift to the school.

They plan to raise funds for their project by selling soft drinks during an inter-house athletics meeting at the school. They decide to buy soft drinks in 2ℓ bottles and sell them in 200 mℓ polystyrene cups.

The class pay R9, 99 for a 2 ℓ bottle of soft drink and 20 cents for a polystyrene cup. They buy 60 two-litre bottles and enough polystyrene cups to be filled by these 60 bottles.

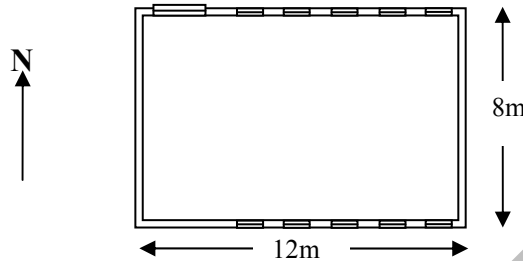
They decide to sell the cups of soft drink for R3,00 each.

- 5.1.1 Calculate the total number of polystyrene cups needed. (3)
- 5.1.2 Calculate the total cost of the soft drink and the polystyrene cups. (3)
- 5.1.3 Calculate the profit made by the learners. (4)

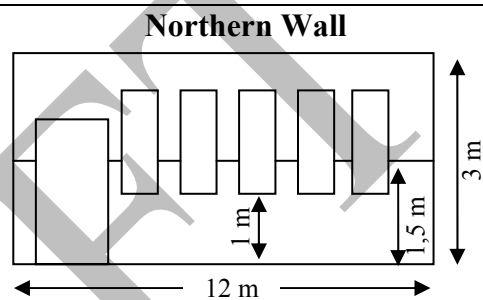
5.2

The classroom they wanted to paint is 12 m long, 8 m wide and 3 m high. The learners decide to paint the bottom half of each wall in blue gloss paint, and the top half of each wall in white PVA.

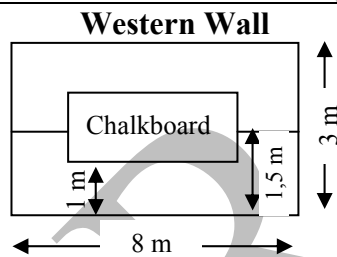
The floor plan of the classroom is given below:



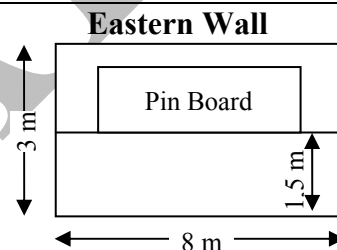
The northern wall of the classroom contains a door and five large windows.
The door is 2 500 mm high and 900 mm wide.
Each of the windows is 1 200 mm high and 450 mm wide.



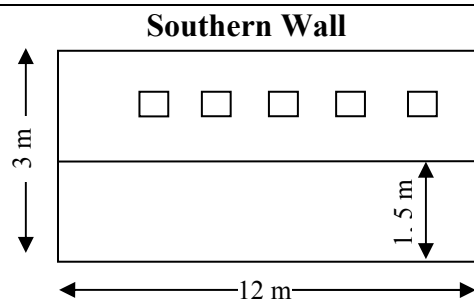
The chalkboard is 1 m high and 4 m wide. It is 1 m from the floor. It is going to be painted with chalkboard paint.



The pin board is 1 m high and 6 m wide. It is 1,5 m from the floor. It is to be painted in blue gloss paint.



The southern wall contains five small windows.
Each window is 450 mm wide and 450 mm high



5.2.1 Calculate the area of the classroom to be painted with:

(a) Blue gloss paint (12)

(b) White PVA (15)

- 5.2.2 One litre of blue gloss paint covers 8 m^2 , one litre of PVA covers 6 m^2 , and one litre of chalkboard paint covers 4 m^2 .

Calculate:

- (a) The number of litres of chalkboard paint that has to be bought. (2)
- (b) The number of litres of blue gloss paint that has to be bought. (2)
- (c) The number of litres of white PVA that has to be bought. (2)
- 5.2.3 The learners also bought four mohair rollers and four paint trays.

Use the following prices to calculate the total cost of painting the classroom, remembering that the learners want to keep costs as low as possible.

PAINT PRICES

Blue Gloss Paint	5 ℓ	R289,00	1 ℓ	R92,00
White PVA	5 ℓ	R220,00	1 ℓ	R92,00
Chalkboard paint	5 ℓ	R270,00	1 ℓ	R79,00
Mohair Roller		R30,00		
Paint tray		R13,00		

(Builders Warehouse – Plascon Paints)

(10)

- 5.3 Determine whether or not the learners have raised enough money for the job.

(2)

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