basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 12

MATHEMATICAL LITERACY P1

FEBRUARY/MARCH 2017

MARKS: 150

TIME: 3 hours

This question paper consists of 11 pages and
an addendum with 5 annexures (6 pages).

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions. Answer ALL the questions.

2. Use the ANNEXURES in the ADDENDUM to answer the following questions:

   ANNEXURE A for QUESTION 1.1
   ANNEXURE B for QUESTION 2.1
   ANNEXURE C for QUESTION 3.1
   ANNEXURE D for QUESTION 3.2
   ANNEXURE E for QUESTION 5.1 and QUESTION 5.2

3. Number the answers correctly according to the numbering system used in this question paper.

4. Start EACH question on a NEW page.

5. You may use an approved calculator (non-programmable and non-graphical), unless stated otherwise.

6. Show ALL calculations clearly.

7. Round off ALL final answers appropriately according to the given context, unless stated otherwise.

8. Indicate units of measurement, where applicable.

9. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.

10. Write neatly and legibly.

QUESTION 1

1.1

> Banks send out transaction statements to their clients periodically.
>
> An extract from the bank statement of an account at BBC Bank and TABLE 1, showing the 2016 pricing guide for transactions at the bank, is shown in ANNEXURE A.

Use ANNEXURE A to answer the questions that follow.

1.1.1 Define the term *credit*, as used in the bank statement. (2)

1.1.2 Interpret the minus sign (−) used with the two balance amounts. (2)

1.1.3 Calculate the missing value **A**. (3)

1.1.4 Determine the total salary deposits for this statement. (2)

1.1.5 1 February 2016 was a Monday.

Determine the number of week days (excluding weekends) covered by the period in the bank statement. (3)

1.1.6 Calculate the cash withdrawal fee for an amount of R5 490,00 that was withdrawn at an ATM of another bank. (3)

1.1.7 State whether the debit order made on 15 February 2016 was internal or external. (2)

1.2

> BBC Bank has two different interest rates for fixed deposits, depending on the amount of money invested. TABLE 2 below shows the annual interest rates for different amounts invested.
>
> **TABLE 2: ANNUAL INTEREST RATES 2015/2016**
>
> | AMOUNT INVESTED | ANNUAL INTEREST RATE |
> |---|---|
> | Less than R10 000 | 6,4% |
> | More than R10 000 | 7,4% |
>
> [Adapted from www.standardbank.co.za]

Use TABLE 2 above to answer the questions that follow.

1.2.1 Mr Simmons invested R9 500 on 1 January 2015 in a BBC bank account.

Show that the final amount in his account will be R10 108 after one year. (3)

1.2.2 Mr Simmons reinvested the amount of R10 108 for a further six months.

Hence, determine the final amount in his account at the end of the six months. (4)

1.3 | The owner of a small business employs domestic workers.

TABLE 3 below shows the minimum wage rates for domestic workers employed.

TABLE 3: MINIMUM WAGES FOR DOMESTIC WORKERS WHO WORK MORE THAN 27 HOURS PER WEEK

	MINIMUM WAGE RATES (IN RAND)	
	1 Dec. 2014 to 30 Nov. 2015	**1 Dec. 2015 to 30 Nov. 2016**
Hourly	10,59	11,44
Weekly	476,55	514,80
Monthly	2 065,05	**B**

[Source: www.labour.gov.za]

Use TABLE 3 above to answer the questions that follow.

1.3.1 Define the term *inflation*. (2)

1.3.2 Use the minimum hourly rate to show that the minimum weekly rate in the table is for working 45 hours per week. (2)

1.3.3 Determine the missing value **B**.

You may use the following formula:

$$\textbf{Minimum monthly rate} = \frac{\textbf{r} \times \textbf{w}}{\textbf{12}}$$

where **r** = minimum weekly rate
       w = number of weeks in a year (3)

1.3.4 During November 2016 the company employed 15 domestic workers who each worked a total of 40 hours for five days.

(a) Calculate the total minimum wage EACH of these domestic workers should be paid for the five days. (2)

(b) Determine the actual hourly rate that was paid to these domestic workers if each domestic worker received a total wage of R550,90 for the five days. (2)

[35]

QUESTION 2

2.1 | The programme for the field events of an athletics meeting held on 12 February 2016 is shown in ANNEXURE B.

Use ANNEXURE B to answer the questions that follow.

2.1.1   The last field events on the programme are expected to take a maximum of 25 minutes to complete.

Determine the total time from the start of this meeting until the end of the last field event. (4)

2.1.2   Calculate the difference in mass between the javelins used by a 19-year-old boy and a 15-year-old boy. (2)

2.1.3   Thabo, born in January 1999, is a shot-put athlete who participated in the athletics meeting.

Determine Thabo's age (in years) and also indicate the time of his event. (3)

2.2 | The athletics coach uses BMI (body mass index) calculations to advise athletes about suitable diets.

TABLE 4 below shows the BMI and corresponding weight status.

TABLE 4: BMI AND CORRESPONDING WEIGHT STATUS

	WEIGHT STATUS				
	UNDER-WEIGHT	NORMAL WEIGHT	OVER-WEIGHT	OBESE	EXTREMELY OBESE
BMI (in kg/m^2)	0–18,4	18,5–24,9	25–29,9	30–34,9	35+

Thabo has a height of 6 feet, 3 inches and his present BMI is 33,9 kg/m^2.
The following conversion may be used: 1 foot = 12 inches

[Source: www.weightwatch.com]

Use TABLE 4 and the information given to answer the questions that follow.

2.2.1   State Thabo's present weight status. (2)

2.2.2   Thabo followed the diet advice of his coach to achieve a desired weight of 200 pounds.

Calculate Thabo's new BMI (rounded off to the nearest whole number) based on this desired weight.

You may use the following formula:

$$\text{BMI (kg/m}^2) = \frac{\text{weight in pounds}}{(\text{height in inches})^2} \times 703$$ (5)

2.3   At the athletics meeting the podium for the 1ˢᵗ, 2ⁿᵈ and 3ʳᵈ places consisted of square-based rectangular blocks of different heights, as shown in the sketch below.

[Source: http://lumberjocks.com]
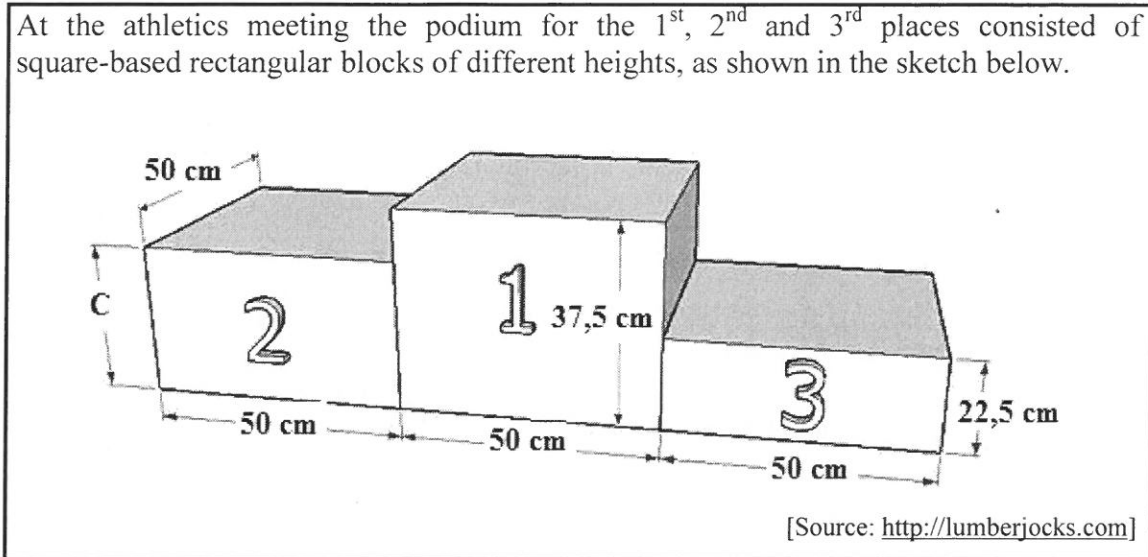
2.3.1   Determine the total length (in metres) of the podium.   (2)

2.3.2   The ratio of the heights of these blocks (for the 1ˢᵗ, 2ⁿᵈ and 3ʳᵈ places) is 5 : 4 : 3.

Determine the missing value **C**.   (3)

2.3.3   Calculate the volume (in cm³) of the block for the 1ˢᵗ position.

You may use the following formula:

Volume of a rectangular prism = length × breadth × height   (3)

2.3.4   The paint required for the top surface of the podium is sold in 500 mℓ cylindrical tins with a radius of 3,77 cm.

Calculate the height (rounded off to the nearest cm) of the cylindrical tin.

You may use the following formula and conversion:

$$\textbf{Height of cylinder} = \frac{\textbf{Volume}}{\boldsymbol{\pi} \times (\textbf{radius})^2} \quad \text{using } \pi = 3{,}142$$

1 ℓ = 1 000 cm³   (4)

[28]

QUESTION 3

3.1 | Lesogo works in Lesotho. She plans to travel from Lesotho to Cape Town, stopping over in Smithfield for one night to visit her friend. The route map from Lesotho to Cape Town, together with an inlay map, is given in ANNEXURE C. |

Use ANNEXURE C to answer the questions that follow.

3.1.1   Lesogo travels in a south-westerly direction from Wepener.

Name the second town on the route map that she will pass.   (2)

3.1.2   Lesogo's friend gave her a set of directions to the Bibas restaurant. Use the inlay map and complete the following directions. Write only the correct answer next to the corresponding letter ((a)–(c)) in your ANSWER BOOK.

• From the R701 turn (a) … onto the N6.
• Soon after you pass the police station turn left into (b) … Street.
• Bibas will be on your (c) …   (3)

3.1.3   Name the national road on the route map that is not shown on the inlay map.   (2)

3.1.4   Identify ALL the provincial roads that may be used to get close to the Gariep Dam.   (3)

3.1.5   Name the towns that lie on the longest route from Wepener to Colesberg, without travelling on the N1.   (3)

3.1.6   The actual distance from Smithfield to Bethulie is 72,9 km.

Determine the scale of the map in the form 10 : …   (4)

3.2   The diagram in ANNEXURE D represents the voting process and the layout of a voting station.

Study the diagram in ANNEXURE D to answer the questions that follow.

3.2.1   Determine the minimum number of voting officials required for a voting station.   (2)

3.2.2   Name the clock direction in which the voters will move from the entrance point to the exit point.   (2)

3.2.3   Name the second-last point a voter will visit at the voting station.   (2)

[23]

QUESTION 4

4.1   Study the following five descriptions:

A   The sum of the data set values divided by the number of data items

B   The middle value in the top half of the ordered data set

C   Data values that are arranged in ascending or descending order

D   The middle value in the bottom half of the ordered data set

E   The middle value of the ordered data set

State which ONE of the descriptions above BEST describes each of the following. Write down only the letter (A–E) next to the question number (4.1.1–4.1.2).

4.1.1   Median   (2)

4.1.2   Upper quartile   (2)

4.2 The school-based assessment (SBA) marks and percentages of the ten lowest performing learners in Mathematical Literacy of a particular school in 2016 are represented in TABLE 5 below.

TABLE 5: SBA MARKS IN MATHEMATICAL LITERACY FOR 2016 OF THE TEN LOWEST PERFORMING LEARNERS

LEARNER	NUMBER OF ASSESSMENT TASKS WRITTEN	TOTAL MARKS ATTAINED	ACTUAL SBA PERCENTAGE MARK (ROUNDED)
A	7	162	46
B	7	168	48
C	5	118	34
D	5	109	31
E	7	137	39
F	6	146	42
G	3	72	21
H	6	144	41
I	6	144	41
J	6	137	39

Information about SBA marks:
- The total mark for each task is 50.
- The actual SBA percentage mark is calculated out of a maximum of 350 marks.
- The SBA percentage marks of candidates submitting valid reasons for not writing a task will be adjusted. The recalculation of the SBA percentage mark will be based only on the actual tasks written.

Use TABLE 5 and the information above to answer the questions that follow.

4.2.1 Determine the probability (as a percentage) of randomly selecting a learner in the table who wrote all the assessment tasks.   (3)

4.2.2 Determine the median total mark.   (3)

4.2.3 Write down the modal actual SBA percentage mark.   (2)

4.2.4 Which learner scored the lowest actual SBA percentage mark?   (2)

4.2.5 Calculate the mean actual SBA percentage mark.   (3)

4.2.6 Learner J submitted a valid medical certificate for the day he missed his one task and qualifies for an adjusted SBA percentage mark.

Determine this learner's adjusted SBA percentage mark.   (3)

4.3 | A part of the 2015 midyear population estimates by race, gender and age of the Republic of South Africa (RSA) is represented in TABLE 6 below. The midyear estimated total population of South Africa for 2015 was 54 957 764.

TABLE 6: 2015 MIDYEAR POPULATION ESTIMATES BY RACE, GENDER AND AGE OF RSA

AGE	COLOUREDS			INDIANS/ASIANS		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
0–4	214 854	211 302	**426 156**	50 222	48 486	**98 708**
5–9	216 858	213 809	**430 667**	49 265	47 800	**97 065**
10–14	217 286	214 494	**431 779**	47 267	46 245	**93 512**
15–19	219 989	217 423	**437 412**	49 926	49 926	**99 852**
20–39	768 179	790 707	**1 558 886**	246 359	220 927	**467 286**
40–59	540 749	610 026	**1 150 775**	176 079	168 398	**344 477**
60–79	148 759	216 786	**365 544**	65 156	83 582	**148 738**
80+	8 145	23 553	**31 698**	3 847	9 363	**13 210**
TOTAL	**2 334 819**	**2 498 098**	**Y**	**688 118**	**674 730**	**1 362 848**

[Source: Adapted from *STATS SA Report*, p. 302]

Use TABLE 6 and the information above to answer the questions that follow.

4.3.1   Which ONE of the following represents the estimated 2015 midyear total population?

A   Fifty-four million, nine hundred and seventy-five thousand, seven hundred and sixty-four

B   Fifty-four million, nine hundred and fifty-seven thousand, seven hundred and sixty-four

C   Fifty-four million, nine hundred and fifty-seven thousand, seven hundred and forty-six   (2)

4.3.2   Identify the race and age group which both have the same number of males and females.   (2)

4.3.3   Calculate the missing value **Y**.   (2)

4.3.4   Determine the probability (as a percentage) of randomly selecting a coloured male from the total population.   (3)

4.3.5   Express the ratio (in simplest form) of the number of Asian females to the number of Asian males.   (3)

4.3.6   Calculate the number of coloured females as a percentage of the total population by the middle of 2015.   (3)

4.3.7   Which age group has the largest number of people?   (2)

4.3.8   State which ONE of the following graphical representations will be best suited to represent the data in TABLE 6:

A   Pie chart
B   Bar graph
C   Scatter plot
D   Box and whisker plot   (2)

[39]

QUESTION 5

5.1

> BusinessTech compares the prices of a basket with selected products from four major supermarkets in South Africa annually.
>
> TABLE 7 in ANNEXURE E shows the comparative prices for a basket of 15 selected products from these supermarkets in June 2015.

Use TABLE 7 in ANNEXURE E to answer the questions that follow.

5.1.1   Which ONE of the supermarkets offers the lowest total price for the basket of selected products?   (2)

5.1.2   Calculate the missing value **X**.   (2)

5.1.3   Calculate the difference in price of a 2 ℓ Coke at Spar and Pick n Pay.   (2)

5.1.4   Determine how many of the selected products at Woolworths are more expensive than at the other supermarkets.   (2)

5.1.5   Write down the selected products that are equally priced at Checkers and Pick n Pay.   (3)

5.1.6   Name the selected product at Woolworths that is more than double the price at Spar.   (2)

5.1.7   Calculate the difference in the total price between the supermarkets with the highest and lowest price for 2,5 kg of chicken.   (5)

5.2

> The comparison of the baskets of products is dependent on the items selected.
>
> BusinessTech used a second basket of products where all the items that were sold per kg, were removed. The infographs in ANNEXURE E illustrate the total price of a basket of 15 products and the total price of a second basket of products that excludes all items sold per kg.

Use the infographs in ANNEXURE E to answer the questions that follow.

5.2.1   Identify the supermarket with the second lowest price for the second basket.   (2)

5.2.2   Name the supermarket whose ranking remained the same for both baskets.   (2)

5.2.3   Calculate the greatest difference in the total prices of the two baskets at the supermarkets.   (3)

[25]

TOTAL: **150**