



education

**MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA**

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

MATHEMATICAL LITERACY P1

SEPTEMBER 2021

MARKS: 150

TIME: 3 hours

This question paper consists of 12 pages, and an addendum with 3 annexures.

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 2.2**
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 ANNEXURE A shows an adapted Eskom tax invoice (total energy consumption) of Mr Phillip Duncan.

Use ANNEXURE A to answer the questions that follow.

- 1.1.1 Determine the missing value **A**, the number of days of the reading period of this statement. (2)
- 1.1.2 Show how the consumption of 759.00 kWh was determined. (2)
- 1.1.3 Calculate the missing value **B**, the energy charge for the usage > 600 kWh. (2)
- 1.1.4 Show how the total amount due was calculated. (2)

- 1.2 Crustaceans come in different sizes and they are ranked according to their length. The Top 10 biggest crustaceans, according to their length, are listed in the table below.

TABLE 1: TOP 10 BIGGEST CRUSTACEANS IN THE WORLD

CRUSTACEANS	LENGTH (in cm)	DISTRIBUTION
American lobster	100	Atlantic Ocean around North America
Tasmanian giant freshwater crayfish	80	Rivers and streams of Tasmania
Giant acorn barnacle	30	Coast of Northwest America
Alicella gigantean	34	Kermadec Trench, New Zealand
Japanese spider crab	400	Pacific Ocean around Southern Japan
Euphasiid Krill	15	Antarctic Ocean
Monster crab	80	Oceans of Australia
Coconut crab	100	Indian Ocean and central Pacific Ocean
Zebra mantis shrimp	40	Indo-Pacific region
Giant tiger prawn	33	Indian Ocean and West Pacific

NOTE:

- Crustaceans are mostly aquatic animals that have an exoskeleton, a pair of appendages on each segment, and two pairs of antennae.
- The length of the crabs are measured according to their leg span.

[Source: Very Interesting Junior, Vol 1, Issue 5]

Use TABLE 1 above to answer the questions that follow.

- 1.2.1 Which Crustacean, according to their length, is the biggest in the world? (2)
- 1.2.2 Sort the length of these Crustaceans in descending order. (2)
- 1.2.3 Which crustacean in the table is mostly distributed in the Antarctic ocean? (2)
- 1.2.4 Write the length of the Alicella gigantean to the length of the Japanese spider crab as a ratio, in simplified form. (2)

1.3 The prices of two types of fans are given below. All prices exclude 15% VAT.

<p>FAN 1: Benett Read Mist Fan</p> <p>Normal price: R1 799 Discount: R200 New price: R1 599 VAT: R239,85</p> 	<p>FAN 2: Benett Read Mist Fan</p> <p>Normal price: Q Discount: R150 New price: R599 VAT: 15%</p> 
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[Source: makro.co.za]

Use the information above to answer the questions that follow.

- 1.3.1 Write down the discount amount for FAN 1. (2)
- 1.3.2 Calculate the normal price (**Q**) of FAN 2. (3)
- 1.3.3 Determine the difference between the normal price and the VAT amount of FAN 1. (3)
- 1.3.4 Show how the VAT amount of R239,85 was calculated. (2)

1.4 The average annual salaries (in rand) of the top 11 best paying jobs in the Republic of South Africa (RSA) for 2021 are listed below.

TABLE 2: AVERAGE ANNUAL SALARIES OF TOP 11 BEST PAYING JOBS

JOB	AVERAGE ANNUAL SALARY (IN RAND)
Specialist doctor	1 123 890
Technical and business architect	871 342
Petroleum engineer	694 700
IT manager	663 539
Industrial engineer	663 347
Management consultant	625 038
Financial manager	619 240
Actuary	550 656
Plant manager	510 348
Project manager	500 000
Software engineer	494 730

[Source: myjobmag.co.za]

Use TABLE 2 above to answer the questions that follow.

- 1.4.1 Write the average annual salary of a specialist doctor in words. (2)
- 1.4.2 Round off the average annual salary of a software engineer to the nearest ten thousand. (2)
- 1.4.3 Determine the median salary. (2)

[32]

QUESTION 2

2.1 A 66 years old Mr Sgudla is working as an architect and earned a taxable income of R543 600 per annum for the tax year 2020/2021.

He contributes to a medical aid fund for himself and his wife.

Use the information above and ANNEXURE B to answer the questions that follow.

2.1.1 Why is it necessary for citizens to pay tax? Give ONE reason. (2)

2.1.2 Calculate Mr Sgudla's annual tax to be paid to SARS during the 2020/2021 financial year. (8)

2.2 Wayne and Rachelle have decided to get married at Francine's wedding venue and they requested a quotation for 50 guests.

The venue does not have a DJ, but recommended Disco DJ, who asks the following rates:

- R250 per ½ hour till 22:00
- R600 per hour or part of an hour after 22:00

Use the information above and the quotation on ANNEXURE C to answer the questions that follow.

2.2.1 What date are they planning for the wedding to take place? (2)

2.2.2 How many waiters are quoted for on the quotation? (3)

2.2.3 Provide ONE reason why wedding venues request a deposit to be paid well in advance of the actual wedding. (2)

2.2.4 Calculate the price of the wedding cake, excluding VAT. (3)

2.2.5 Wayne's father invested R40 500 over a 3-year period at 5,2% interest compounded annually.

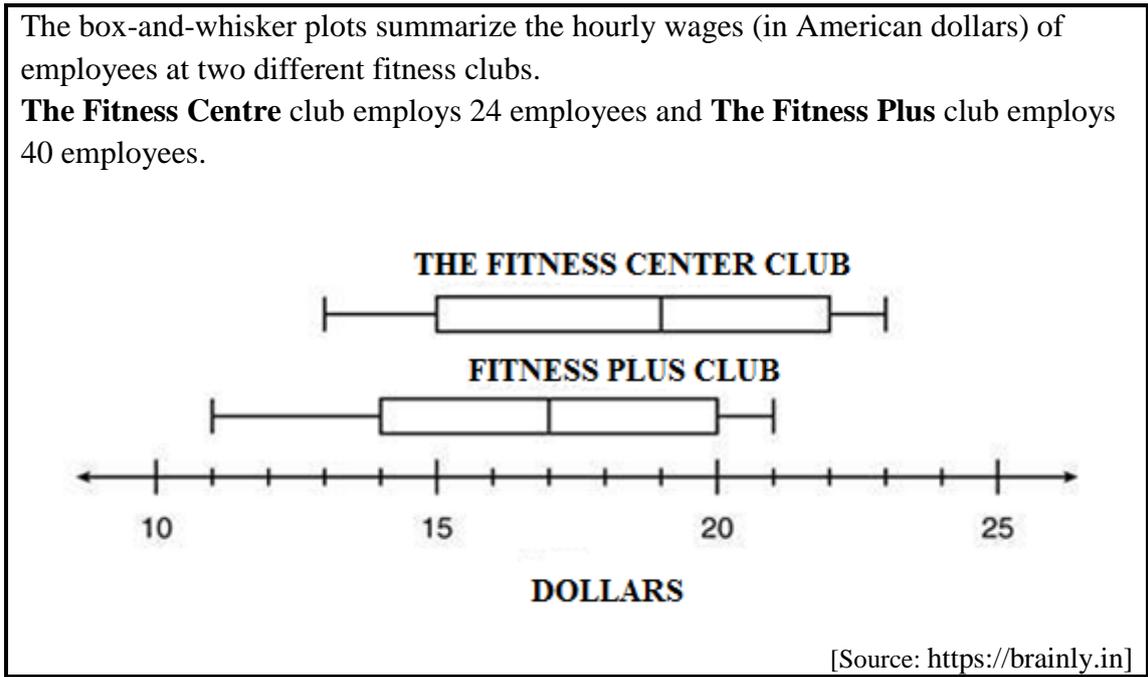
Show with calculations whether this investment at maturity will be sufficient to cover 75% of the total cost of the quotation. (7)

2.2.6 Calculate the cost of the DJ if they request that he should play music from 18:30 to 23:45. (6)

[33]

QUESTION 3

- 3.1 The box-and-whisker plots summarize the hourly wages (in American dollars) of employees at two different fitness clubs.
The Fitness Centre club employs 24 employees and **The Fitness Plus** club employs 40 employees.



Use the information and the box and whisker plot above to answer the questions that follow.

- 3.1.1 What percentage of employees at Fitness Plus club earn an hourly wage of \$14 and less? (2)
- 3.1.2 Calculate the inter-quartile range of the hourly wages for the employees working at The Fitness Center club. (3)
- 3.1.3 The employees work eight hours a day in these fitness clubs. An analyst reckons that more than 50% of the employees at The Fitness Center club are earning more than \$144 per day. Verify by means of calculations if this statement is correct. (4)
- 3.1.4 Margaret has been offered a top management job at both clubs. **EXPLAIN** which club she must choose to work at, if her decision is based on salary only. (3)

3.2 The impact of a meteorite creates a hollowed-out area that is known as a crater. In TABLE 5 below is information related to the Top 11 biggest meteor craters in the world.

TABLE 5: TOP 11 BIGGEST METEOR IMPACT CRATERS IN THE WORLD

CRATER NAME	PLACE AND COUNTRY OF ORIGIN	SIZE (in km)	EXISTANCE TIME (in million years)
Vredefort	Free State, South Africa	300	2 023
Chicxulub	Yucatan, Mexico	150	66
Sudbury	Ontario, Canada	130	1 849
Popigai	Siberia, Russia	100	35
Manicouagan	Quebec, Canada	100	216
Acraman	South Australia	90	580
Morokweng	Kalahari Desert, South Africa	70	145
Kara	Nenetsia, Russia	65	70
Beaverhead	Idaho and Montana, USA	60	600
Tookoonooka	Queensland, Australia	55	123
Charlevoix	Quebec, Canada	54	342

[Source: Very Interesting Junior Vol 3 Issue 18]

Use TABLE 5 above to answer the questions that follow.

3.2.1 Calculate the difference, in years, between the existance time of the Sudbury crater and the Morokweng crater. (3)

3.2.2 Using the size of the top 11 biggest craters in the world, which measure/s of central tendency best describes the set of data? Verify your answer by means of calculations. (6)

3.2.3 What is the probability of randomly selecting a crater from the top 11 biggest craters that is younger than 210 million years? (2)

[23]

QUESTION 4

- 4.1 A community survey was done in 2016. TABLE 6 below shows statistics of two neighbouring municipalities (i.e. Emalahleni and Thembesile) in Mpumalanga.

TABLE 6: STATISTICS OF TWO NEIGHBOURING MUNICIPALITIES IN MPUMALANGA

DESCRIPTION	Emalahleni municipality	Thembisile municipality
Area of municipality in km ²	2 683 km ²	2 398 km ²
Number of inhabitants per km ²	170 people per km ²	139 people per km ²
% houses with piped water inside the dwelling	63%	8%
% houses with toilet facilities connected to sewerage system	78,1%	10,8%
% houses with electricity	80%	98,6%
Number of households	150 419	82 738
Annual household income (estimated by the median)	R57 300	R29 400

[Adapted from source: wazimap.co.za]

NOTE: Inhabitants are people staying or living in or occupies a place (municipal area)

Use TABLE 6 above to answer the questions that follow.

- 4.1.1 Determine the number of people living in Thembisile municipality. (3)
- 4.1.2 One municipality employee claims that the number of people staying in Emalahleni compared to Thembisile exceeds 130 000. Verify if the statement is correct. Show ALL calculations. (4)
- 4.1.3 Calculate the number of houses with piped water inside the dwelling in Thembisile municipality. (3)
- 4.1.4 The average annual household income of Emalahleni municipality is R57 300 compared to the average annual income of a similar municipality (size and population) in Kansas City, Missouri (USA) of \$45 376.
Calculate the difference, in rand, between the two annual household incomes if the exchange rate is:
R1,00 = \$0,067 (4)
- 4.1.5 What is the probability of randomly finding a house without electricity in Thembisile? (2)

- 4.2 Mr Mboweni is an owner of a few petrol stations and kept record of the changes in the petrol price during 2020 as shown in TABLE 7.

TABLE 7: PETROL PRICE PER LITRE FOR 2020

Month	Inland 95 Unleaded Petrol	Coastal 95 Unleaded Petrol	Inland 93 Unleaded Petrol
January 2020	R16,16	R15,52	R15,84
February 2020	R16,03	R15,39	R15,71
March 2020	R15,84	R15,20	R15,52
April 2020	R13,96	R13,26	R13,76
May 2020	R12,22	R11,52	R12,02
June 2020	R13,40	R12,70	R13,20
July 2020	R15,12	R14,42	R14,83
August 2020	N	R14,47	R14,88
September 2020	R15,18	R14,48	R14,89
October 2020	R14,86	R14,16	R14,66
November 2020	R14,59	R13,89	R14,39
December 2020	R14,46	R13,76	R14,26

[Source: <https://www.aa.co.za/fuel-pricing>]

Use TABLE 7 above to answer the questions that follow.

- 4.2.1 Calculate the percentage change of the Inland 93 unleaded petrol price from January 2020 to May 2020.

The following formula may be used.

$$\% \text{ Change} = \frac{\text{May 2020} - \text{January 2020}}{\text{January 2020}} \times 100\% \quad (3)$$

- 4.2.2 Give ONE reason why there is a difference in the Inland and Coastal prices for petrol. (2)

- 4.2.3 If the average (mean) price of the Inland 95 Unleaded petrol was R14,75 per litre for 2020, calculate the petrol price per litre during August 2020, the value of N. (4)

- 4.2.4 Peter is an instructor and drove 750 km in March 2020 using Inland 93 unleaded petrol. His car uses 10,5 litres petrol per 100 km. His employer gave him a compensation of R2 000 for March 2020, for using his own car for work purposes.

Verify by means of calculations if the compensation was enough to cover his petrol expenses. (5)

[30]

QUESTION 5

- 5.1 Stacey is moving into a new flat and wants to buy a bedroom suite. The Corvette 2 piece bedroom suite is on sale at a furniture store as advertised.



CASH PAYMENT: WAS: R16 895 NOW: R12 999

or

HIRE PURCHASE: 10% deposit and R688,00 per month x 36 months.

[Source: www.russels.co.za]

Use the information above to answer the questions that follow.

- 5.1.1 Define the term “hire purchase”. (2)
- 5.1.2 Give the value of the voucher one gets when buying a Corvette two piece bedroom suite. (2)
- 5.1.3 Calculate the actual discount (in rand) of the bedroom suite. (2)
- 5.1.4 Calculate the percentage discount on the bedroom suite. Answer correct to one decimal place. You may use the following formula:
- $$\text{Percentage discount} = \frac{\text{Actual discount}}{\text{Original price}} \times 100\% \quad (3)$$
- 5.1.5 Stacey buys the bedroom suite on hire purchase. How much will she pay in total over the whole term, excluding the deposit? (2)
- 5.1.6 After two months the cash price further dropped by 15%. Calculate the new cash price for the bedroom suite. (3)

5.2 Jakes is hosting an athletics camp at a venue for a maximum of 50 athletes. He is hiring the venue for R1 000 and are planning to hand out a drawstring bag with a towel and a water bottle in.

The costs for a filled bag are as follows:

- Drawstring bag is R25,26
- Towel is R26,76
- Water bottle is R109,27

It costs a further R10,00 per item to print Jakes logo on each item.

To take part in this camp each athlete has to pay R315.

[Source: Adapted from La Promotions invoice]

Use the information above to answer the questions that follow.

5.2.1 The formula to calculate Jakes’ total cost is as follows:

$$\text{Total cost of camp} = \text{R1 000} + \text{R191,29} \times (\text{number of filled bags})$$

(a) Show how the R191,29 in the formula above was determined. (3)

(b) Calculate the total cost for 50 athletes attending the camp. (2)

5.2.2 TABLE 8 below shows the relationship between the number of athletes attending the camp and Jakes’ income.

TABLE 8: NUMBER OF ATHLETES ATTENDING AND THE TOTAL INCOME OF JAKES.

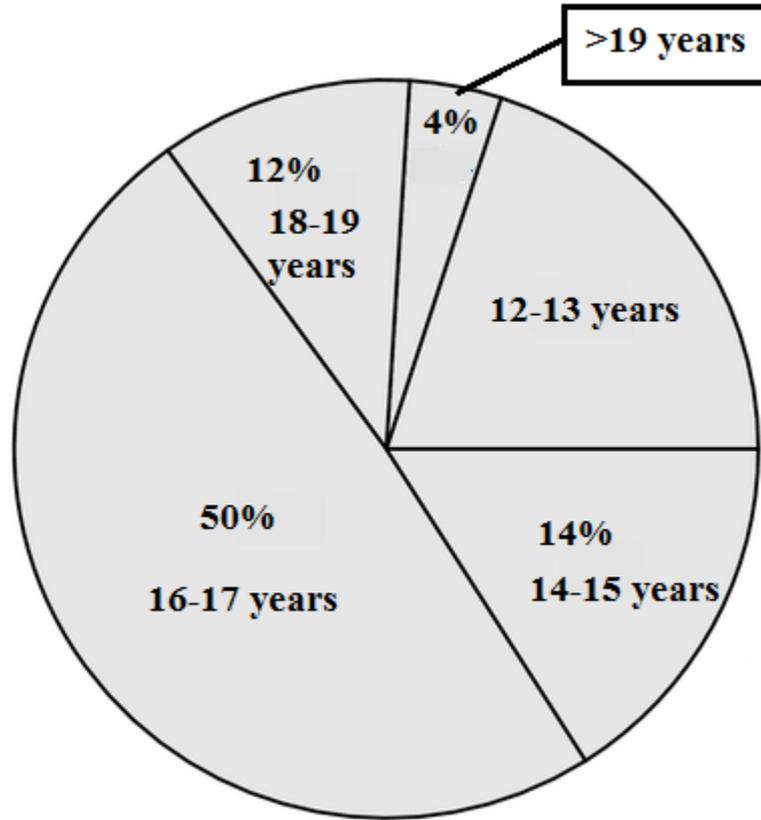
Number of athletes attending	0	5	R	30	35	50
Total income (rand)	0	1 575	6 300	9 450	L	15 750

Determine the missing values **R** and **L**. (4)

5.2.3 Define the term break-even-point in the given context. (2)

5.3 There were 50 athletes that attended the camp. The figure below shows the percentage of athletes from different age groups at the camp.

FIGURE 1: PERCENTAGE OF ATHLETES IN DIFFERENT AGE GROUPS ATTENDING THE CAMP



Use information and FIGURE 1 above to answer the questions that follow.

- 5.3.1 Determine the percentage of athletes in the 12 to 13 years age group that attended the camp. (2)
- 5.3.2 What is the probability of randomly selecting an athlete in the 14 to 17 years age group? Give your answer as a decimal. (3)
- 5.3.3 Calculate the number of athletes, older than 17 years at the camp. (2)

[32]

TOTAL: 150