higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY
(Second Paper)
NQF LEVEL 2

(10401012)

23 February 2018 (X-Paper)
09:00 –12:00

Drawing instruments and non-programmable calculators may be used.

This question paper consists of 10 pages and 2 addenda.

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TIME: 3 HOURS
MARKS: 150

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions:

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 calculations, diagrams, graphs, et cetera, 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. Answer QUESTION 3.1.3 on the attached ADDENDUM A and QUESTION 4.2.6 on the attached ADDENDUM B and hand this in with the ANSWER BOOK.
8. Write neatly and legibly.

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QUESTION 1

1.1 Modisane decided to grow his own vegetables in the backyard of his house. He prepared a rectangular vegetable garden with a length of 7,5 metres and a breadth of 6,8 metres as shown on the diagram below.

1.1.1 Modisane wants to fence the vegetable garden, including a gate, with shade netting. Calculate the length, in meter, of the shade netting that he will need by using the formula below.

Formula: Perimeter = 2 (L + B) (2)

1.1.2 Modisane wants to cover the top of the garden with the same netting materials as well. Calculate the area of the top of the garden that will be covered by using the formula below.

Formula: Area = length × breadth (3)

1.1.3 The shade netting is sold at R23,50 per square meter. At how much will Modisane purchase the netting materials to cover the top of the garden described in QUESTION 1.1.2? (3)

1.1.4 Modisane bought a water tank to store water during rainy seasons in order to water his vegetables. The diameter, AB, and the height of the tank, AC, are indicated in the diagram below:

Calculate the volume of the tank to the nearest three decimal places by using the formula below.

Formula: Volume = $\pi \times \text{radius}^2 \times \text{height}$, use $\pi = 3{,}14$ (4)

1.2 The floor of the school hall has to be tiled. The size of each square tile is 35 cm by 35 cm. A rectangular wooden stage EFGH is 6 m wide and is built against one side of the wall of the school hall. The wooden stage will not be tiled. Study the floor plan of the school hall below and answer the questions that follow:

Given: BE = HC = 3 m, EF = 6 m and AD = 18 m.

1.2.1 Calculate the area of one tile in square metres, without rounding the answer off, by using the formula below.

Formula: Area = side^2 (2)

1.2.2 Calculate the area, in m^2, of the floor to be tiled by using the formula below.

Formula: Area = length × breadth (3)

1.2.3 The tiler requires that 5% more tiles be purchased to allow for cutting and breakages. Calculate how many tiles should be bought. Round-off your answer to one tile. (6)

1.2.4 The tiles come in boxes of 12 each. Calculate the number of boxes that are needed. (3)

1.2.5 One box of tiles costs R368,00 and the tiler charged R60,00 per square metre for tiling costs (excluding other materials).
Calculate the total cost of tiles and labour for tiling the floor of the hall. (6)

1.3 Mr Kruger uses the following map to plan his trips between different National Parks. (N: North and S:South as shown below)

1.3.1 Write down the grid reference of the Bloemfontein airport on the above map. (1)

1.3.2 Which national parks are situated in the Western Cape? (2)

1.3.3 In which general direction is Kimberley from East London? (2)

1.3.4 It took Mr Coetzee 30 minutes to fly the distance of 153 kilometres between Kimberley and Bloemfontein. Calculate the average speed of the flight in kilometres per hour.

Formula: Average speed = distance travelled ÷ time taken (3)

[40]

QUESTION 2

2.1 A cell phone shop offers the following two cell phone packages to customers.

Option 1	Option 2
• Free cell phone • Casual chat 100 two-year contract • Once-off connection fee of R109,00 • Monthly subscription fee of R99,00 for two years • Itemised billing of R22,50 per month • Caller line identity for R9,00 per month	• Free cell phone • Casual chat 100 two-year contract • Once-off connection fee for R219,00 • Monthly subscription for the first 12 months of R59,00 and thereafter R112,00 per month • Itemised billing of R20,00 per month • Caller line identity for R9,50 per month
Call rates: Peak: R1,85/min Off-peak: R1,09/min	**Call rates:** Peak: R2,10/min Off-peak: R1,19/min

2.1.1 Calculate the call rates of Option 1 as well as the call rates of Option 2 if you are to spend one hour per month on average on a cell phone during peak time and two hours during off-peak time. (6)

2.1.2 Calculate the total monthly cost of Option 1 during the first 12 months if you are to spend one hour per month on average on a cell phone during peak time and two hours during off-peak time, as described in QUESTION 2.1.1. (4)

2.1.3 The total monthly cost for Option 2 is R357,30. Use your answer in QUESTION 2.1.2 to explain which option would be cheaper for you during the first 12 months of a contract. Motivate your answer by showing all your calculations. (2)

2.2 Kgabo wants to buy a new couch for her lounge. The cash price of the couch is R7 899,00 including VAT. She does not have the cash, so she decides to buy it on hire purchase. Featherby Furnishers offers the following deal:

Deposit:	R1 399,00
Monthly installment:	R439,50
Payment Period:	24 months

2.2.1 What is the cash price of the couch excluding VAT? (3)

2.2.2 Determine the total amount of money that Kgabo would pay using the hire-purchase option. (3)

2.2.3 How much interest would Kgabo pay by using the hire-purchase option? (3)

2.2.4 Explain why saving and buying with cash is a better option than using hire purchase. (2)

2.3 Batho TVET College's main campus has two groups of Hospitality level four students. The groups are called Group A and Group B. These two groups will be raising funds and are in competition with each other.

Both of these groups will be selling cold drinks during break time. They buy the cold drinks in 2- litre bottles.

Group A uses 125 milliliter cups and sells a cup of cooldrink at R2,00 each.
Group B uses 250 milliliter cups and sells a cup of cooldrink at R3,50 each.

2.3.1 How many cups of cooldrink can Group A sell from a ONE 2- litre bottle? (3)

2.3.2 How many cups of cooldrink can Group B sell from a ONE 2- litre bottle? (3)

2.3.3 Both groups bought the 2- litre cold drink bottles for R8, 99 each.
Group B claims that their profit of selling cups from a ONE 2- litre bottle will be greater than that of Group A, because their cups are bigger and they charge more money per cup.
Show with the necessary calculations whether you agree or disagree with Group B and give a reason for your answer. (8)

2.3.4 Calculate to the nearest percentage, the percentage profit that Group A made on selling cups from a ONE 2- litre bottle.

Formula: Percentage Profit = (Profit ÷ Cost Price) × 100 (3)

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QUESTION 3

3.1 The Bushveld TVET College is planning to build the Hotel School as a simulation centre for the Hospitality and Tourism students. The following table shows the number of days that it would take the workers to complete the Hotel School.
Study the table and answer the questions that follow:

No. of Workers	600	500	400	300	**B**
No. of days to build the hotel school	100	200	300	**A**	600

3.1.1 If 300 workers were used, how many days would it take to build the Hotel School? (Hint: The value of **A)** (2)

3.1.2 Follow the pattern and calculate the missing value of **B.** (2)

3.1.3 Plot the graph of the number of workers to the number of days it will take to build the Hotel School on the grid provided on ADDENDUM A.
Label the graph and both the axes. (7)

3.1.4 Read from the graph the number of days that it will take to complete the task if only 250 workers were employed. (2)

3.1.5 Is the relationship between the number of workers and the number of days to build the Hotel School directly or inversely proportional?
Explain your answer. (3)

3.2 Palesa decides to find another job that will offer her a higher salary. She is offered a job at a company in Pretoria, but she lives in Johannesburg. She will need to use the toll road to travel from home to work and back.

The graph below shows the toll fees that she has to pay for each single trip.

Use the graph to answer the following questions:

3.2.1 Describe the kind of proportion that this graph shows and explain your answer. (3)

3.2.2 Read from the graph and complete the following table of values showing the costs of: 0, 5, 10, 15, and 20 single trips.

Number of single trips	0	5	10	15	20
Cost in Rands					

(5)

3.2.3 Approximately how much will Palesa pay for 12 single trips? (2)

3.2.4 How many single trips can she make for R120,00? (2)

3.2.5 Calculate the cost of five return trips. (3)

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QUESTION 4

4.1 The data below shows the mass (in kg) of students in a Mathematical Literacy L2 class.

58 62 70 73 67 64 70 88 75 78 81 96 70 82 77

4.1.1 Arrange the given data in ascending order (3)

4.1.2 Determine the mean of the given data set. (4)

4.1.3 Determine the median of the given data set. (2)

4.1.4 Determine the modal mass of students in the class. (2)

4.1.5 Do you think that the mean and median values, calculated in QUESTIONS 4.1.2 and 4.1.3 respectively, provide a good indication of the average mass of the students in the class? Explain your answer. (3)

4.1.6 Do you think that the modal value provide a good indication of the average mass of students in the class? Explain your answer. (3)

4.1.7 Redraw the following table in your answer book and organise the sorted data in QUESTION 4.1.1 in the following frequency table:

Mass interval in kg	Tally	Frequency
40 – 49		
50 – 59		
60 – 69		
70 – 79		
80 – 89		
90 +		

(7)

4.2 The shop where Modisane buys his seeds for his vegetable garden recorded the most popular vegetables sold during the warm season. Study the table below and answer the questions.

Seeds planted during the warm season	**Percentage (%) seeds sold**
Pumpkin	44
Bean	18
Tomato	12
Cucumber	16
Mushroom	10
TOTAL	**B**

4.2.1 Calculate the total percentage of warm season seeds sold by the shop. (2)

4.2.2 If 525 packets of warm season seeds were sold, how many of these were cucumber seeds? (3)

4.2.3 What is the range of the warm season seeds? (2)

4.2.4 Draw a bar graph to represent the seeds sold during the warm season on the grid provided on ADDENDUM B. Label the graph and both the axes. (8)

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TOTAL: 150

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ADDENDUM A

CENTRE NUMBER

EXAMINATION NUMBER

QUESTION 3.1.3

ADDENDUM B

CENTRE NUMBER

EXAMINATION NUMBER

QUESTION 4.2.6

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