higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY
(First Paper)
NQF LEVEL 2

(10401012)

2 November 2018 (X-Paper)
09:00–12:00

Calculators may be used unless stated otherwise.

This question paper consists of 14 pages and 2 addenda.

NCV

TIME: 3 HOURS
MARKS: 150

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.

2. Read ALL the questions carefully.

3. Clearly show ALL calculations, diagrams, graphs, et cetera that will be used in this paper.

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

5. Round off your answers to TWO decimals where necessary, unless stated otherwise.

6. Drawing instruments, including rulers, pairs of compasses, and protractors may be used.

7. Diagrams are not necessarily drawn to scale.

8. Answer QUESTIONS 3.1.1 and 4.3.2 on the attached ADDENDUM A, and QUESTIONS 5.2.3 and 5.2.4 on the attached ADDENDUM B.

   HAND IN the addenda with the ANSWER BOOK.

9. Write neatly and legibly.

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QUESTION 1

1.1 Calculate the following without using a calculator. Show ALL working.

1.1.1 $125 + 9 \times 7$ (2)

1.1.2 $(121 \div 11) - \sqrt{49}$ (3)

1.1.3 $\frac{3}{4}$ of $195 - 62{,}75$ (3)

1.2 Rearrange the following numbers in descending order:

-148; 12,65; 150; 3 (2)

1.3

The length of the above pencil is measured in centimetres.

What is the length of the pencil in millimetres? (2)

1.4 A table can seat 6 people.

Determine how many of these tables are needed to seat 68 people. (3)

1.5 If 5 kg of cheese costs R249,86, estimate how much the price of the cheese is per kilogram. (2)

1.6 An ultramarathon runner starts his race at 05:45 and finishes at 4:28 pm.

How long did he take to complete the race? (3)

1.7 A juice concentrate and water are mixed in the ratio of 1 : 4.

1.7.1 If you have 4 litres of juice concentrate, how many litres of water would you need to mix the juice?

1.7.2 How many litres of juice would you have after mixing 4 litres of concentrate?

(2 × 2) (4)

1.8 The VAT-exclusive price of a photocopier machine is R 12 862.

Calculate the VAT-inclusive price of the photocopier machine, if VAT is calculated at 14%. (3)

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1.9 The prices of nappies are advertised as follows:

Jumbo bag (52 nappies) = R 160,95
Econobox (111 nappies) = R 325,00

Is it more economical to buy the Jumbo bag or the Econobox? Show ALL your calculations to justify (explain) your answer. (3)

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QUESTION 2

2.1 Choose a description from COLUMN B that matches a picture in COLUMN A. Write only the letter (A–G) next to the question number (2.1.1–2.1.5) in the ANSWER BOOK.

COLUMN A	COLUMN B
2.1.1	A circle B diameter C triangle D sphere E cube F cylinder G rectangle
2.1.2	
2.1.3	
2.1.4	
2.1.5	

(5 × 2) (10)

2.2 Below is a sketch of a telephone tower. Use the sketch to answer the questions.

2.2.1 Calculate the height of the telephone tower (AB) in metres.

2.2.2 Use the theorem of Pythagoras to determine the length of AC in metres.

FORMULA: $(AC)^2 = (AB)^2 + (BC)^2$

(2 × 3) (6)

2.3 Adam, Ben and Craig are residents of the Holiday Paradise resort. The resort offers several leisure activities. The map below clearly shows the positions of Adam, Ben and Craig in their apartments.

Study the map to answer the questions.

[Source: *http://www.education.vic.gov.au/*]

2.3.1 What is the direction of the rock climbing activity from Ben? (1)

2.3.2 Name TWO water sports activities that the resort offers. (2)

2.3.3 The scale of the map is 1 cm : 100 m.

Calculate the real distance from Craig's house to the golf course if the map distance is 5,75 cm. (3)

2.4 Below is the floor plan of a farm cottage. The dimensions of the cottage are in metres.

Study the floor plan and answer the questions.

2.4.1 How many doors are there on the floor plan? (1)

2.4.2 Calculate the area of the bedroom floor.

FORMULA: Area = length × breadth (3)

2.4.3 The owner of the house wants to tile the floor of the bedroom. The following costs are applicable:

Tiles and grouting: R1 475
Hiring a tiler: R85/m²

Calculate the total cost of tiling the bedroom. (4)
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QUESTION 3

3.1 Zinzi studies at a TVET college and works part-time. She receives financial support every month from a bursary scheme. She kept a record of her income and expenses for the month of January.

The following amounts were recorded:

Rent	R2 100
Groceries	R2 568
Wages: Part-time job	R2 100
Transport	R 430
Bursary	R3 000
Pocket money from parents	R1 250
Clothing account	R1 348

3.1.1 Use Zinzi's records for the month of January to draw up a budget for the month of February on the table found on ADDENDUM A (attached). (9)

3.1.2 Calculate whether Zinzi's budget has a surplus or a deficit.

FORMULA: Surplus/Deficit = Income - Expenses (3)

3.1.3 Give ONE way in which Zinzi can balance her budget. (1)

3.2 The daily car rental rates of two car-hire companies are given below:

INDOCARS	R310 per day 200 km free/day R1,30/km (if 200 km per day is exceeded)
AVICARS	R355 per day Unlimited kilometres

Use the above rates to answer the questions.

3.2.1 What is the rate that INDOCARS charges for travelling more than 200 km per day? (1)

3.2.2 Sipho wants to rent a car for 4 days and plans to travel a distance of 900 km.

Determine whether it will be cheaper for Sipho to rent a car from INDOCARS or from AVICARS. Show ALL your calculations to motivate your answer. (6)

3.3 Study the payslip of Mr Moosa and answer the questions.

INFINITY FACTORY SHOP				
Employee	T N Moosa		Pay date	01/11/2017
ID Number	690231 0118 081		Job description: Accounts manager	
Deposit institution: ABC Bank			Account number: xxxxxxx1245	
EARNINGS		**DEDUCTIONS**		
Description	**Amount in Rand**	**Description**	**Reference number**	**Amount in Rand**
Basic salary	23 282	Tax	062154932	2 434
		Pension fund	52148754	1 746
		Medical aid	65821465	3 625
		Union fees	235612	60
GROSS SALARY	23 282	TOTAL DEDUCTIONS		7 865
NET SALARY				

3.3.1 On which date does Mr Moosa get paid? (1)

3.3.2 How much does Mr Moosa pay towards tax per month? (1)

3.3.3 Use the information on the above payslip to calculate Mr Moosa's net salary.

FORMULA: Net salary = Gross salary - Deductions (2)

3.4 An extract of a cheque account is presented below:

DATE	DESCRIPTION	AMOUNT IN RAND	BALANCE
10 Feb	OPENING BALANCE		1 855,52Cr
15 Feb	Deposit: Y Schoeman	1 500,00Cr	
20 Feb	Talksure	350,50	3 005,02Cr
22 Feb	Best Buys	1 246,85	1 758,17Cr
28 Feb	#Monthly Account Fee	100,00	1 658,17Cr
	CLOSING BALANCE		1 658,17Cr

#VAT Inclusive @ 14%

Use the extract of the cheque account to answer the following questions:

3.4.1 What is the opening balance of the cheque account? (1)

3.4.2 Calculate the balance of the cheque account on the 15th of February. (2)

3.4.3 Calculate the VAT-exclusive amount for the account fee. (3)

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QUESTION 4

4.1 The graph below shows how many bricklayers are needed to build a wall in a certain number of days. Study the graph and answer the questions.

4.1.1 Name the dependent variable. (1)

4.1.2 Name the independent variable. (1)

4.1.3 How many days will 10 bricklayers take to complete the job? (1)

4.1.4 How many bricklayers are needed to complete the job in 5 days? (2)

4.1.5 Is the graph an example of a direct or an indirect relationship? Give a reason for your answer. (2)

4.1.6 A good bricklayer can lay an average of 500 bricks per day. Approximately how many bricks would be needed to build the wall if the wall was completed in one day? (3)

4.2 4.2.1 Write down the missing two numbers in each of the following patterns:

a) 26 ; 20 ; 14 ; …… ; …….. (2)

b) 2 ; 8 ; 32 ; 128 ; ……. ; ……. (2)

4.2.2 Determine whether the pattern, in QUESTION 4.2.1 a), has a constant ratio or a constant difference. Write down the value of the constant ratio/difference to substantiate your answer. (2)

4.3 Mary and her friends are baking pancakes to sell at the annual church bazaar. Below is a table to show how many pancakes (on average) they can bake per hour. Study the table and answer the questions.

Time in hours	0	1	2	3	5	**B**	10
Number of pancakes	0	150	300	450	**A**	1200	1500

4.3.1 Calculate the values for **A** and **B**. (4)

4.3.2 Use the above table to draw a line graph on the grid found on ADDENDUM A (attached). Provide a suitable heading and label the horisontal and vertical axes of the graph. (6)

4.3.3 Determine the number of pancakes that can be baked in 4 hours. (1)

4.3.4 Determine the time it will take to bake 900 pancakes. (1)

4.3.5 The pancakes will be sold at a price of R4 each.

(a) Calculate the number of pancakes sold if R484,00 was received from pancake sales.

(b) Calculate the income if 465 pancakes are sold.

(2 × 1) (2)

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QUESTION 5

5.1 A group of students collected data to determine the average maximum temperature per month for their town. After collecting the data they compiled the graph below.

Study the graph and answer the questions.

5.1.1 What type of graph did the students use to display their information? (1)

5.1.2 Which month had the lowest average temperature? (1)

5.1.3 Calculate the range of the average temperatures for the year. (2)

5.1.4 Determine the mode for the average temperatures for the year. (1)

5.1.5 Calculate the mean of the average maximum temperatures for the year. (3)

5.1.6 Calculate the median of the average maximum temperatures for the year. (3)

5.1.7 The town in which they live, experiences runaway veld fires during the hottest months of the year.

Name TWO months during which veld fires are most likely to occur in this town. (2)

5.2 Students attended their annual athletics meeting, which was held at the municipal athletics track in their town. A lecturer carried out a survey on the type of transport used by the students to get to the athletics track.

The following table indicates the types of transport the students used:

Bus	Train	Walk	Walk	Train
Taxi	Taxi	Taxi	Walk	Bus
Taxi	Bus	Taxi	Walk	Walk
Walk	Taxi	Walk	Taxi	Taxi

5.2.1 What is the sample size of this survey? (1)

5.2.2 When collecting information for the survey, what technique would be more effective: an observation technique or an interview technique? Justify (explain) your answer. (2)

5.2.3 Use the information from the table above to complete the frequency table found on ADDENDUM B (attached). (4)

5.2.4 Use the frequency table to draw a bar graph on the grid found on ADDENDUM B (attached). Provide a suitable heading for the graph. (5)

5.2.5 Identify the least popular mode of transport. Give ONE possible reason why this mode of transport is the least popular. (2)

5.2.6 Calculate the percentage of students who walked to the athletics track. (3)

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TOTAL: 150

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ADDENDUM A **EXAMINATION NUMBER:**

QUESTION 3.1.1

INCOME			**EXPENSES**	
Description	Amount in Rand		Description	Amount in Rand
Total income			**Total expenses**	

(9)

QUESTION 4.3.2

(6)

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ADDENDUM B **EXAMINATION NUMBER:** | | | | | | | | | | | | | |

QUESTION 5.2.3

MODE OF TRANSPORT	TALLY	FREQUENCY
BUS	lll	3
WALK		
TRAIN		
TAXI		
	Total:	

(4)

QUESTION 5.2.4

(5)

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