higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY
(First paper)
NQF LEVEL 2

(10401012)

21 February 2020 (Y-paper)
13:00–16:00

Drawing instruments and non-programmable calculators may be used.

This question paper consists of 11 pages and 2 answer sheets.

011Q1S2021

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TIME: 3 HOURS
MARKS: 150

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the 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, that are used to answer questions.
5. Round off the answers to two decimal places where necessary, unless stated otherwise.
6. Drawing instruments, including rulers, compasses and protractors may be used.
7. Diagrams are not necessarily drawn to scale.
8. Answer QUESTION 4.1.4 on ANSWER SHEET 1 and QUESTIONS 5.1.1 and 5.1.2 on ANSWER SHEET 2. Write your examination number in the spaces provided on the ANSWER SHEETS and hand in the ANSWER SHEETS with your 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 $10 + 2 \times 12$ (2)

1.1.2 $\sqrt{100} - (3^2 + 1)$ (3)

1.2 Write 125% as a decimal fraction. (2)

1.3 Last year, Andrew's height was 1,84 m. If he grew by another 7 cm, calculate his new height. Give the answer in centimetres. (3)

1.4 Pam recorded her activities for May on the calendar below. Study the calendar and answer the questions.

SUN	MON	TUE	WED	THU	FRI	SAT
		1 Gym Holiday	**2**	**3** Gym	**4**	**5**
6	**7**	**8** Gym	**9** Ben's birthday	**10** Gym	**11** Practical due date	**12** Netball match
13 Lunch with parents	**14**	**15** Gym	**16** Study for test series	**17** Gym	**18**	**19** Netball match
20	**21** Test	**22** Test Gym	**23** Test	**24** Test Gym	**25** Test	**26**
27	**28** Test	**29** Test Gym	**30**	**31** Gym		

1.4.1 How many days are there in May? (1)

1.4.2 On which days does Pam usually go to the gym? (2)

1.4.3 Write 19:30 in a 12-hour clock format (analogue time). (2)

1.4.4 On Wednesday, 16 May, Pam decided to start studying for the upcoming test series. She started at 19:30 and stopped at 23:35.

Calculate the time Pam spent on studying. Give your answer in hours and minutes. (3)

1.5 White paint and red paint are mixed in the ratio of 2:3 to make pink paint.

1.5.1 If you have 6 ℓ of white paint, how many litres of red paint do you need to get the same pink colour? (3)

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1.5.2 How many litres of paint would you have after mixing the white and red paints? (2)

1.6 In a class of 40 students there are 18 girls. What percentage of the class are girls? (2)

1.7 If 45 ℓ of petrol cost R650, calculate the price of petrol per litre. (2)

1.8 The price of sugar is advertised as follows:

1 kg bag of sugar for R15,98

2,5 kg bag of sugar for R36,75

Would it be more economical to buy a 1 kg or a 2,5 kg bag of sugar? Show all your calculations. (3)

[30]

QUESTION 2

2.1 Tobego is building a model sail boat. Below is a sketch of a model sailing boat. The boat is made up of two sails; a main sail and a head sail. Study the sketch and answer the questions.

2.1.1 Name the type of shape of the main sail of the sailing boat. (1)

2.1.2 Calculate the length of the hypotenuse of the main sail of the sailing boat.

Formula: $c^2 = a^2 + b^2$. (4)

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2.1.3 The head sail is half the size of the main sail. Calculate the area of the head sail of the sailing boat.

Formula: Area of triangle = ½ × base × perpendicular height
Area of head sail = ½ × area of main sail (6)

2.2 Litha will be playing in a water polo tournament at the Joan Harrison Swimming Pool in East London. He is staying at Chandler's guest house across the road from Buffalo City College. Study the map below and answer the questions.

[Source: *www.Googlemaps.com/*]

2.2.1 Write down the directions and the names of the roads on which Litha must walk to get from the Chandler's Guest House to the Joan Harrison swimming pool. The route has been plotted with a dotted line. (3)

2.2.2 What is the shortest walking distance from Chandler's Guest House to the Joan Harrison swimming pool and how long would it take to walk that distance? (2)

2.2.3 Name one other place on the map that offers accommodation. (1)

2.2.4 The scale of the map is 1:6 000.

Calculate the real distance between Buffalo City College and Lynette Elliot Frail Care if the measurement on the map is 20 cm. Give the answer in kilometres. (5)

2.2.5 In which compass direction is the Joan Harrison Swimming Pool from Selborne College? (2)

2.3 Laser beams are often used to secure open doorways. Mirrors are placed in such a way that they reflect the laser beam to cross the doorway more than once. If either the laser beam or the mirror is disturbed, the siren will be activated.

Study the sketch below and answer the questions.

[Source: *www.edgefx.in/*]

2.3.1 How many mirrors are indicated on the sketch? (1)

2.3.2 How many times does the laser beam cross the doorway? (1)

2.3.3 Name the shape of the amplifier. (1)

2.3.4 The height of the doorway is 2,2 m and the breadth of the doorway is 0,9 m.

Calculate the area of the doorway.

Formula: Area = length × breadth. (3)

[30]

QUESTION 3

3.1 Choose an item from COLUMN B that matches a description in COLUMN A. Write only the letter (A–G) next to the question number (3.1.1–3.1.6) in the ANSWER BOOK.

COLUMN A		COLUMN B	
3.1.1	Money received from government for a specific purpose	A	salary
3.1.2	Example of a fixed expense	B	budget
3.1.3	Example of variable income	C	loan repayment
3.1.4	A plan to forecast monthly income and expenses	D	UIF
3.1.5	Monthly payments to employees	E	SARS
3.1.6	Unemployment Insurance Fund	F	grant
		G	commission received

(6 × 1) (6)

3.2 UBER and BALEKA are two companies that offer taxi services in a city. Study the rates of the two companies below and answer the questions.

UBER	
Call-out fee of R20 plus R7 per kilometre	Call-out fee of R13,50 plus R9,60 per kilometre

3.2.1 What is the rate that UBER charges to travel a distance of 1 kilometre? (2)

3.2.2 Denise wants to travel a distance of 10 km within the city centre.

Determine whether it will be cheaper for her to travel with UBER or BALEKA. Show ALL your calculations. (5)

3.3 Study the payslip of Miss DB Cooper below and answer the questions.

SWEETS FOR AFRICA				
Employee	DB Cooper		Pay date	25 March 2018
Employee Number	654128		Job description: Accounts manager	
Deposit institution: PC Bank			Account number: xxxxxxx9783	
MONTHLY EARNING		**DEDUCTIONS**		
Description	**Amount in Rand**	**Description**		**Amount in Rand**
Basic salary	35 000,00	PAYE (Income tax)		8 590,83
Overtime	0,00	Pension fund		2 625,00
Allowances	0,00	UIF		350,00
		Medical aid		1 500,00
		Union membership		40,00
GROSS SALARY	35 000,00	TOTAL DEDUCTIONS		13 105,83
NET SALARY				

3.3.1 Is a salary advice/payslip a monthly or a yearly document? (1)

3.3.2 On which date is Miss Cooper paid? (1)

3.3.3 What is Miss Cooper's employee number? (1)

3.3.4 Calculate the percentage of Miss Cooper's gross salary that goes towards medical aid. Round off your answer correct to 3 decimal places. (4)

3.3.5 Calculate Miss Cooper's net salary.

Formula: Net salary = Gross income – Total deductions (2)

3.4 The table below compares the bank charges of a bank for 2017 and 2018.

Absa Gold Cheque Account	2017 Fees	R500 transaction in 2017	2018 Fees	R500 transaction in 2018
Withdrawal (Native)	R3,95 + (R1,35 per R100)	R10,70	R4,50 + (R1,40 per R100)	R11,50
Withdrawal (Other)	R9,95 + (R1,35 per R100)	R16,70	R10.50 + (R1,40 per R100)	R17,50
Withdrawal (POS)	R3,95	R3,95	R4,50	R4,50
Deposit (ATM)	R3,95 + (R1,35 per R100)	-	R4,50 + (R1,40 per R100)	-
Debit order (internal)	Free	–	Free	–
Debit order (external)	R16.95	–	R18,00	–
Account fee (PAYT)	R42.00	–	R45,00	–

[Source: *https//businesstech.co.za/*]

Study the above table to answer the questions.

3.4.1 How much did a R500 transaction for a withdrawal (POS) cost in 2017? (1)

3.4.2 What was the difference (in Rand) for a R500 withdrawal (POS) between 2017 and 2018? (2)

3.4.3 How much would you have to pay to deposit R1 000 at the ATM in 2018? (3)

3.4.4 What was the cheapest way to withdraw R500 in 2018 and how much did it cost? (2)

[30]

QUESTION 4

4.1 A local soccer club is selling raffle tickets to raise funds. The winner stands a chance to win a VIP ticket to watch a live match between Kaizer Chiefs and Orlando Pirates. One raffle ticket costs R50. Study the table below and answer the questions.

Number of tickets	10	20	**A**	40	50
Income in Rands	500	1 000	1 500	**B**	2 500

4.1.1 How much would the income be if 10 tickets were sold? (1)

4.1.2 How many tickets must be sold to have an income of R2 500? (1)

4.1.3 Calculate the missing values of A and B in the table. (4)

4.1.4 Use the values in the above table to plot and draw a line graph on the grid found in ANSWER SHEET 1 (attached). Label the horizontal and vertical axes, and provide a suitable heading for the graph. (6)

4.1.5 Name the dependent and independent variables. (2)

4.1.6 Is the graph an example of a direct or indirect/inverse relationship? Give a reason for your answer. (3)

4.2 The graph below shows the time, in minutes, a car will take to travel a distance of 60 km. The speed at which the car travels will determine the time it will take to complete the distance. Study the graph to answer the questions.

4.2.1 Copy the table below in the ANSWER BOOK and fill in the missing numbers on the table. Use the above graph to help you.

Speed in km/h		60		120
Time in minutes	75		45	

(4)

4.2.2 Is the graph an example of an increasing or decreasing relationship? Give a reason for your answer. (3)

4.3 Write down the missing two numbers in the following patterns:

4.3.1 9 ; 27 ; 81 ; ……. ; …….. (2)

4.3.2 9 ; 12 ; 15 ; …… ; …….. (2)

4.3.3 Determine whether the pattern in QUESTION 4.3.1 has a constant ratio or a constant difference. Give a reason for your answer. (2)

[30]

QUESTION 5

5.1 A primary school teacher recorded the number of times the learners in his class could skip in one minute. The results of the fitness test are presented in the table below:

67	21	61	52	35
54	51	42	61	41
42	28	47	32	52
28	37	45	28	32
49	47	31	40	38

Study the table above and answer the questions.

5.1.1 Use the information from the table above to complete the tally and frequency table found in ANSWER SHEET 2(attached). (6)

5.1.2 Use the information on the frequency table in QUESTION 5.1.1 to draw a histogram on the grid found in ANSWER SHEET 2 (attached). Provide suitable labels for your histogram. (7)

5.1.3 Calculate the mean/average of the number of skips completed in one minute. (3)

5.1.4 What is the mode of the number of skips completed in one minute? (1)

5.1.5 Calculate the range of the number of skips completed in one minute. (3)

5.2 John owns a music store that is close to a college. He used a questionnaire to determine the type of music that students liked and presented the results of his survey on the graph below:

Use the above graph to answer the questions.

5.2.1 Calculate the sample size of John's survey. (2)

5.2.2 What was the most popular type of music? (1)

5.2.3 What was the least popular type of music? (1)

5.2.4 Give one reason why the above graph is misleading. (2)

5.2.5 Calculate the percentage of students who chose classical music as their favourite type of music? (3)

5.2.6 What type of graph is represented above? (1)

[30]

TOTAL: 150

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ANSWER SHEET 1 EXAMINATION NUMBER:

QUESTION 4.1.4

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ANSWER SHEET 2 EXAMINATION NUMBER: | | | | | | | | | | | | | |

QUESTION 5.1.1

INTERVAL	TALLY	FREQUENCY
20–29	IIII	4
30–39		
40–49		
50–59	IIII	4
60–69		
	TOTAL:	25

6

QUESTION 5.1.2

7

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