higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY
(First Paper)
NQF LEVEL 3

(10401023)

20 February 2020 (X-Paper)
09:00–12:00

Nonprogrammable calculators may be used.

This question paper consists of 10 pages and 2 answer sheets.

007Q1S2020

Please turn over

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TIME: 3 HOURS
MARKS: 150
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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.   Start EACH question on a NEW page.

5.   Show ALL calculations clearly.

6.   Round off your answers correctly according to the given context. In all other cases, where the context is not specific, round off your answers correctly to two decimal places.

7.   Indicate units of measurement, where applicable.

8.   Diagrams are not necessarily drawn to scale.

9.   Write neatly and legibly.

10.   Answer QUESTION 4.3.3 on ANSWER SHEET 1 and QUESTION 5.1.1 on ASNSWER SHEET 2. Write your EXAMINATION NUMBER in the spaces on the ANSWER SHEETS and hand in the ANSWER SHEETS with your ANSWER BOOK.

QUESTION 1

1.1 Calculate each of the following **without** the use of a calculator. Show **ALL** working.

    1.1.1 $180 + 23 \times 6$ (2)

    1.1.2 $\left(1\dfrac{1}{3} + \dfrac{2}{3}\right) \times 2^3$ (3)

1.2 A concrete mix is made by mixing four parts of gravel, two parts of sand and one part of cement.

    1.2.1   Write the above mix as a ratio.   (1)

    1.2.2   If two wheelbarrows of gravel are used to make a concrete mix, calculate the number of wheelbarrows of sand and the number of wheelbarrows of cement that will be needed.   (2)

1.3 Eight oranges cost R24. Calculate the price of 12 oranges.   (3)

1.4 Convert 4,5 kg to grams.
(1 kg = 1000 g)   (2)

1.5 The price of a washing machine after a discount of 13% reduced to R4 699. Calculate the original price of the of the washing machine. Show ALL calculations.   (4)

1.6 Round off 1 999,34 to the nearest thousand.   (1)

1.7 A greengrocer packs 12 oranges in a plastic bag. Calculate the number of bags he will need if he has 250 oranges. Show all calculations.   (3)

1.8 The scale of a map is 1 : 50 000. Determine the actual distance in km if the measurement on the map is 23,5 cm.

Hint: 1 km = 100 000 cm   (3)

1.9 Sipho travels from Bloemfontein to Pretoria with public transport. He leaves Bloemfontein at 17:30 and reaches Pretoria at 04:49.

Calculate the time taken to reach Pretoria. Give your answer in hours and minutes.   (4)

1.10 California is 10 hours ahead of South Africa. If the time in South Africa is 10:30, what will the time be in California.   (2)

[30]

QUESTION 2

2.1 Bongi tutors NCV students in a rented room. She wants to paint and decorate one of the walls of the room. The sketch below shows the dimensions of the window (160 cm by 130 cm), the door (225 cm by 95 cm) and the wall (2,9 m high and 4,5 m long).
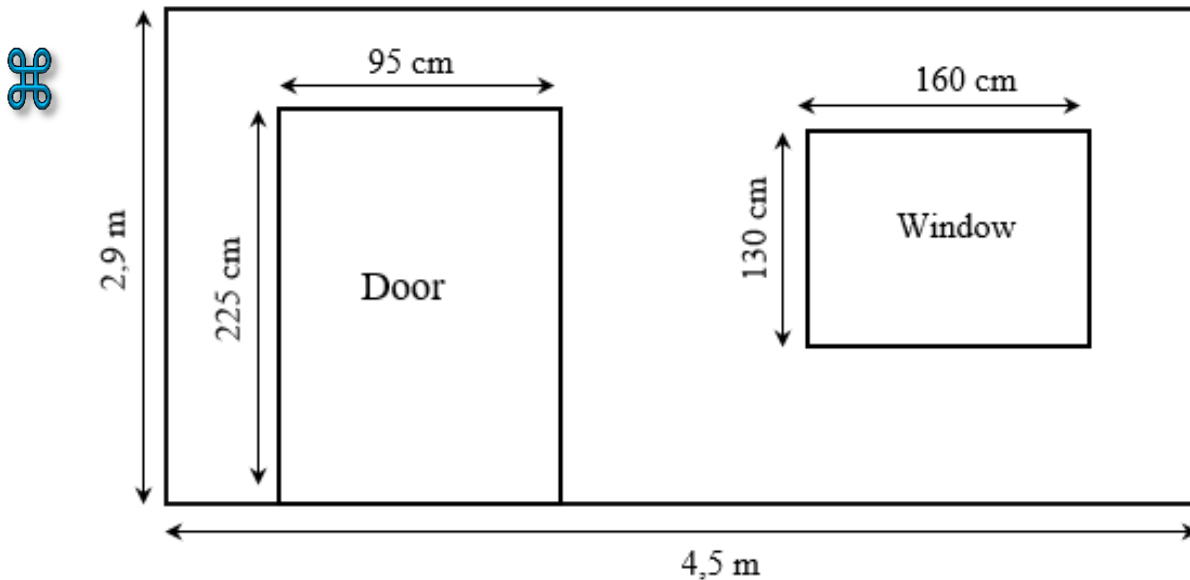
Study the above information to answer the questions that follow:

2.1.1 Calculate the area of the door in m^2. Round off your answer correct to two decimal places.

Formula: Area of rectangle = length × breadth and 100 cm = 1 m. (4)

2.1.2 If the window and door are not to be painted, show, by calculations that the area of the wall to be painted is 8,83 m².

Formula: Area of rectangle = length × breadth (7)

2.1.3 The paint that Bongi wants to buy covers an area of 7 m² per litre. How many litres of paint will Bongi need for TWO layers of paint? (round off your answer to the nearest litre. (3)

2.1.4 The paint is available in the following sizes and prices:

500 ml @ R59
1 litre @ R110
5 litre @ R449

Which size of paint is most economical per litre? Show all your calculations. (3)

2.1.5 If Bongi wants to buy only the amount of paint she needs, which size paint must she buy? Show your calculations. (3)

2.1.6   Bongi wants to paste a decorative border around the window. The border is pasted 20 cm away from the window.
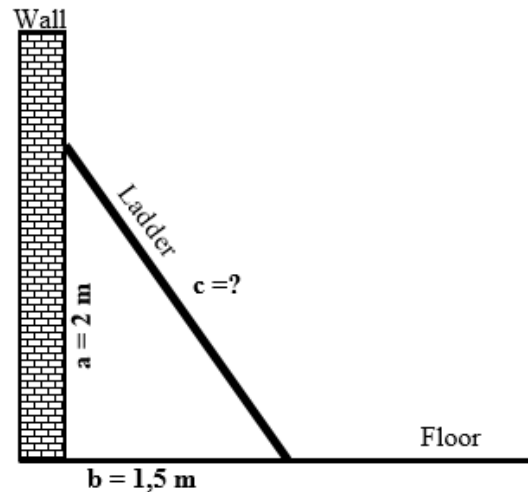
If the decorative border is sold in full metre lengths, calculate how many metres of border Bongi must buy.

Formula: Perimeter = 2(length + breadth)   (5)

2.2   Bongi climbs up a ladder to paint the upper parts of the wall. The ladder is placed 1,5 metres away from the wall and at a height of 2 metres on the wall as shown in the sketch alongside:

2.2.1   What shape does the ladder make with the wall and the floor?   (1)

2.2.2   Calculate the length of the ladder in metres.

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

[30]

QUESTION 3

3.1   Choose a term from COLUMN B that matches a description in COLUMN A. Write only the letter (A–G) next to the question number (3.1.1–3.1.5) in the ANSWER BOOK.

	COLUMN A		COLUMN B
3.1.1	Financial document given to a client who wants to know the price of an item or service.	A	receipt
		B	salary advice
3.1.2	Point where total expenses and total income are equal	C	income and expenditure statement
3.1.3	Added tax charged on the price of articles or services	D	quotation
		E	budget
3.1.4	Financial document given to a client as proof of payment	F	VAT
3.1.5	Financial document given to an employee as evidence of renumeration (wage/salary)	G	breakeven point

(5 × 1)   (5)

3.2   The bank statement below is for a company's business cheque account. Study the bank statement to answer the questions:

DATE	TRANSACTION DESCRIPTION	AMOUNT	BALANCE
02/05/2018	Balance		50 018,98 Cr
02/05/2018	Magtape Debit: Rent	3 000,00	47 018,98 Cr
02/05/2018	Bank Charges	11,24	47 007,74 Cr
03/05/2018	Withdrawal (Branch)	2 000,00	45 007,74 Cr
03/05/2018	Bank Charges	11,80	**(a)** Cr
05/05/2018	Withdrawal (ATM)	1 000,00	43 995,94 Cr
05/05/2018	Bank Charges	9,45	43 986,49 Cr
06/05/2018	Magtape Debit: Vodacom	6 429,95	37 556,54 Cr
06/05/2018	Bank Charges	11,24	37 545,30 Cr
07/05/2018	Magtape Credit: Sarah Suleman	**(b)** Cr	38 435,88 Cr
15/05/2018	EFT Payment To: Bongi's Construction	19 000,00	19 435,88 Cr
15/05/2018	EFT Transfer From: Savings Account	36 633,84 Cr	56 069,72 Cr
30/05/2018	Monthly Account Fee	81,00	55 988,72 Cr
31/05/2018	EFT To: Business Credit Card	15 000,00	**(c)**
31/05/2018	Statement Closing Balance		**(d)**

3.2.1   What is the period covered by this statement?   (2)

3.2.2   What is the opening balance of this statement?   (1)

3.2.3   Write the abbreviation 'Cr' in full?   (1)

3.2.4   A withdrawal of R1 000,00 was made from the account on 5 May 2018. What is the effect of the withdrawal on the bank balance?   (1)

3.2.5   Calculate **(a)**, the bank charges of 3 May 2018. Show all calculations.   (3)

3.2.6   Calculate **(b)**, the deposit made on 7 May 2018. Show all calculations.   (3)

3.2.7   Calculate **(c)**, the statement balance after the R15 000,00 payment. Show all calculations.   (3)

3.2.8 Write down the amount **(d)**, the closing balance of the statement. (1)

3.2.9 Which transaction attracted the highest bank charges? (1)

3.3 A municipality charges a monthly tariff on water usage and sewage disposal for 2019/2020 as shown below. Use the table to answer the questions below:

Water usage		Sewage: Disposal Charges	
	Tariff per kilolitre	volume	Tariff per kℓ
0 – 6 kℓ	Free	0 – 6 kℓ	Free
More than 6 kℓ up to 15 kℓ	R21,04	+6 – 15 kℓ	R14,20
More than 15 kℓ up to 30 kℓ	R23,04	+15 -30 kℓ	R18,45
More than 30 kℓ up to 60 kℓ	R26.63	+30 kℓ	R21,10

3.3.1 Write down the water bill for a household using 5,5 kℓ. (1)

3.3.2 Calculate the cost of using 25 kℓ of water. Show all calculations. (4)

3.3.3 Calculate the cost of disposing 17 kℓ of sewage. Show all calculations (4)

[30]

QUESTION 4

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

4.1.1 - 3 ; - 9 ; - 27 ; …….. ; …….. (2)

4.1.2 3 ; 8 ; 13 ; ……… ; ……….. (2)

4.1.3 Determine whether the pattern in QUESTION 4.1.2 has a constant ratio or a constant difference. Substantiate your answer by writing down the constant ratio or a constant difference. (2)

4.2   A car-hire company charges a flat rate of R2 000,00 for the initial 1 000 km and R3,00 per km travelled thereafter. Study the graph below showing the rental cost per km travelled and then answers the questions.

Rental cost per km travelled
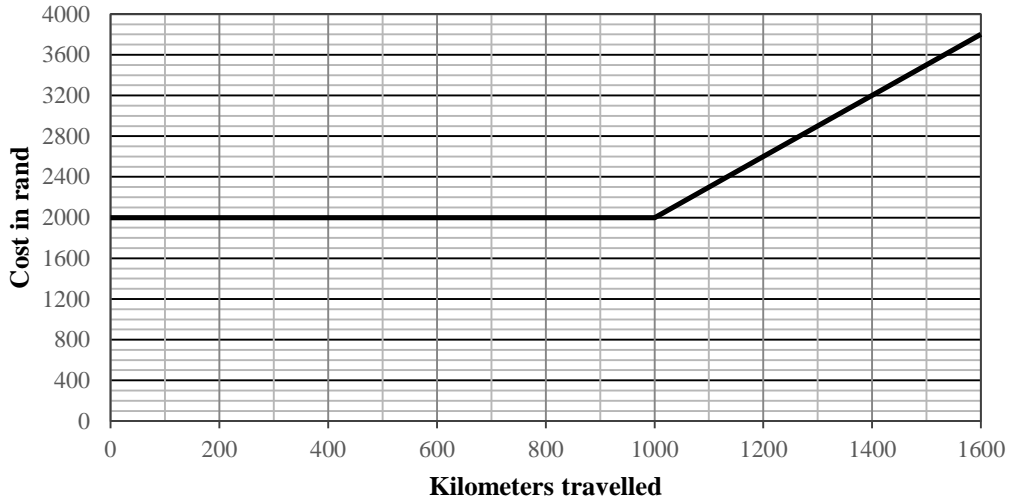
4.2.1   Why is the graph a straight horizontal line from 0 km to 1 000 km?   (1)

4.2.2   Why does the graph increase after 1 000 km?   (1)

4.2.3   Use the graph to determine the total rental cost for travelling 890 km.   (1)

4.2.4   Use the graph to determine the cost of travelling 1 500 km.   (2)

4.2.5   Use the graph to determine the distance travelled if R3 200 is paid in rental costs.   (2)

4.2.6   The average fuel consumption of the car is 10 km/litre and the price of petrol is R15,80 per litre. Calculate the petrol cost for a 1 400 km journey.

         Formula: Petrol bill = kilometres travelled ÷ fuel consumption × cost of 1 litre of petrol   (4)

4.2.7   Derive a formula to calculate the cost of travelling after 1 000km.   (3)

4.3   The table below shows the relationship between the number of workers available and the number of days required to complete a job:

Number of workers	50	40	25	20	10
Number of days to complete the job	40	50	80	100	**A**

Use the table to answer the questions that follow:

4.3.1   Calculate the value of A.   (2)

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

4.3.3 Use 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)

[30]

QUESTION 5

5.1 A campus cafeteria manager did a survey to find out which fast-food students preferred. Given below are the responses from the sample of students that were surveyed.

KEY		
BB	:	Beef Burger
KP	:	King Pie
CMS	:	Chicken and Mayo sandwich
KT	:	Kota
VK	:	Vetkoek

KP, BB, KT, CMS, KT, KT, VK, BB, CMS, VK,
KP, VK, KT, BB, CMS, KT, VK, VK, KP, KT,
KP, KT, BB, VK, KP

5.1.1 Use the above data to complete the frequency table found in ANSWER SHEET 2 (attached). (6)

5.1.2 According to this survey, which fast-food is least preferred by the students? (1)

5.2 The table below compares the number of serious crime cases in South Africa, between April 2015 to March 2016 and April 2016 to March 2017 cycles:

Serious Crime category	April 2015 to March 2016	April 2016 to March 2017	Case difference
Car hijacking	14 602	16 717	2 115
Truck hijacking	1 184	1 183	-1
Robbery of cash in transit	137	152	15
Bank robbery	6	3	-3
Robbery at residential premises	20 820	22 343	1 523
Robbery at business premises	19 698	20 680	982
Total	56 447		**A**

5.2.1 Calculate the value of **A.** (2)

5.2.2 Name the type of serious crime that showed the most significant increase between April 2015–March 2016 and April 2016–March 2017? (2)

5.2.3 The three crimes: car hijacking, house robbery and business robbery are widely known as the 'trio crimes'.

What is the total number of trio crimes committed for the year April 2016–March 2017? (4)

5.2.4 According to the statistics, the case difference for bank robbery for the two years is -3.

Explain what this difference means. (2)

5.2.5 Calculate the percentage increase in the number of serious crime cases between April 2015–March 2016 and April 2016–March 2017. (4)

5.3 The pie chart below shows how Sandy spends her time on any given weekday. Study the pie chart and answer the questions that follow:
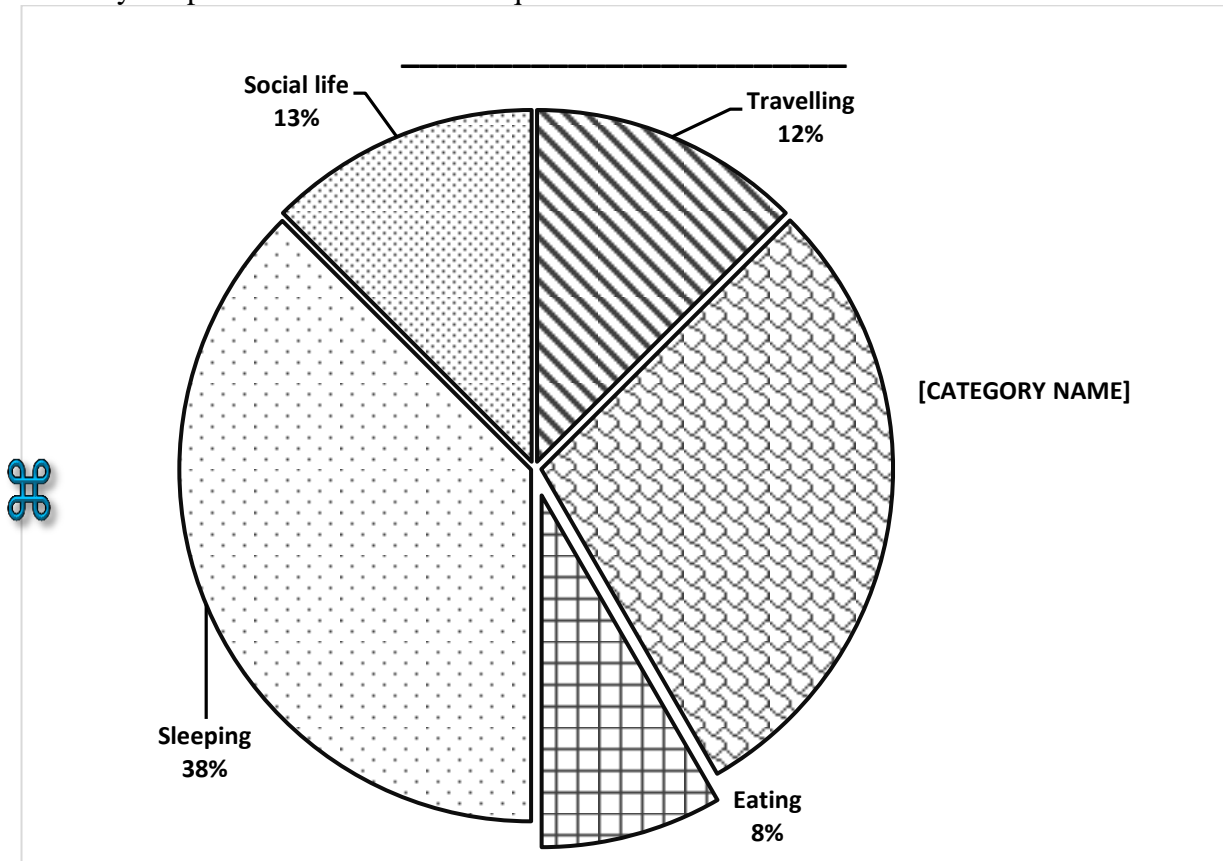
5.3.1 Write a suitable title for the pie chart. (1)

5.3.2 Which activity does Sandy spend the most time on? (1)

5.3.3 Calculate the percentage of the time Sandy spends on working per weekday. Show all calculations. (3)

5.3.4 How many hours does Sandy spend on sleeping and travelling per weekday? (2)

5.3.5 Calculate the number of hours Sandy spends on her social life per weekday. (2)
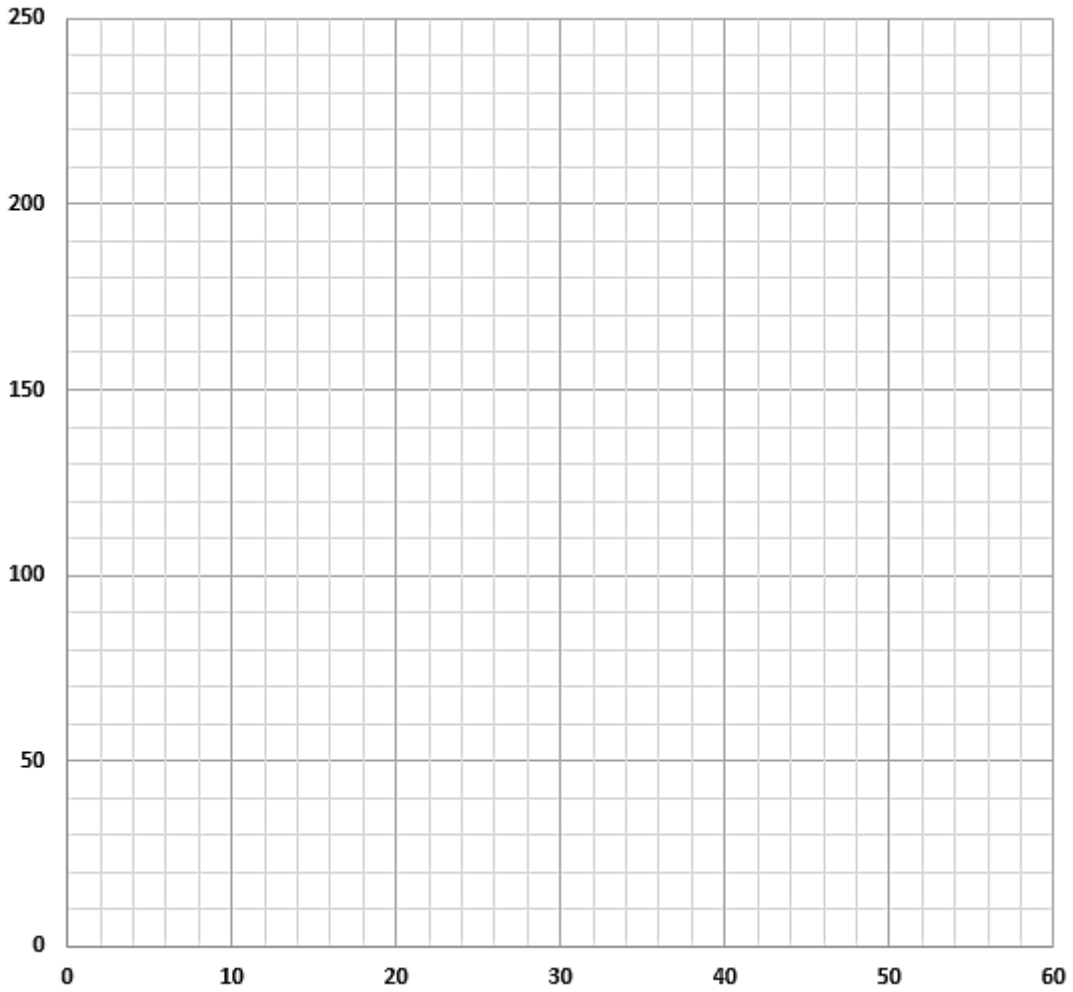
[30]

[150]

ANSWER SHEET 1

EXAMINATION NUMBER:

4.3.3
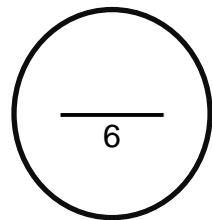
ANSWER SHEET 2   **EXAMINATION NUMBER:**

5.1.1

FREQUENCY TABLE		
FAST FOOD	**TALLY**	**FREQUENCY**
Beef Burger		
King Pie		
Chicken and Mayo sandwich		
Kota		
Vetkoek		
TOTAL		

6