



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY

(First paper)

NQF LEVEL 4

(10401034)

16 November 2020 (X-paper)

09:00–12:00

Nonprogrammable calculators may be used.

This question paper consists of 10 pages and 1 answer sheet.

007Q1N2016

<p>TIME: 3 HOURS MARKS: 150</p>

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
 2. Read all the questions carefully.
 3. Answer QUESTION 4.2.1 on ANSWER SHEET 1
 4. Number the answers according to the numbering system used in this question paper.
 5. Clearly show all calculations, diagrams, graphs, et cetera used in determining the answers.
 6. Start each question on a new page.
 7. Approved calculators may be used, unless otherwise stated.
 8. Round off the answers according to the context. In the absence of a context, round off correctly to 2 decimals.
 9. Use $\pi = 3,14$. Learners will be penalised if any other value is used.
 10. Drawing instruments including rulers, pairs of compasses and protractors may be used.
 11. Diagrams are not necessarily drawn to scale.
 12. Write neatly and legibly.
-

QUESTION 1

- 1.1 Calculate the following without using a calculator. Show all steps used to calculate the answer.

$$60 - (\sqrt{16} + 2 \times 4) \div 3$$



(4)

- 1.2 Rearrange the following fractions in ascending order. Show all steps that are used to determine the answer.

$$\frac{12}{14}, \frac{3}{7}, \frac{2}{3}$$

(4)

- 1.3 Convert 0,375 kilograms to milligrams. Show ALL steps.

$$(1\,000\text{ mg} = 1\text{ gram and } 1\,000\text{ grams} = 1\text{ kg})$$



(4)

- 1.4 Write 140% as a mixed fraction in simplified form. Show all steps used to calculate the answer.

(2)

- 1.5 A bus departed at 15:37 on Thursday and arrived at its destination at 10:42 on Monday.

How long did the journey take? Write your answer in days, hours and minutes.



(3)

- 1.6 The radius of a sphere is 5,7 cm.

Calculate the volume of the sphere. Show ALL steps.



$$\text{Formula: Volume of sphere} = \frac{4}{3}\pi r^3, \text{ where } \pi = 3,14$$



(3)

- 1.7 Convert R9 755 to Japanese yen (¥) if the exchange rate is ¥1 = R0,13. Round off your answer to the nearest yen.

(3)

- 1.8 Kenenisa Bekele set the world record for the 5000 metre marathon by completing the race in 12 minutes and 37 seconds. Calculate his average speed in km/h (kilometers per hour).



$$60\text{ seconds} = 1\text{ minute}$$

$$60\text{ minutes} = 1\text{ hour}$$

$$1000\text{ m} = 1\text{ km}$$

$$\text{distance} = \text{speed} \times \text{time}$$

(4)

1.9 Which bathsoap pack is more cost effective per gram for the 2 packs listed below?
Show all calculations to justify your answer.

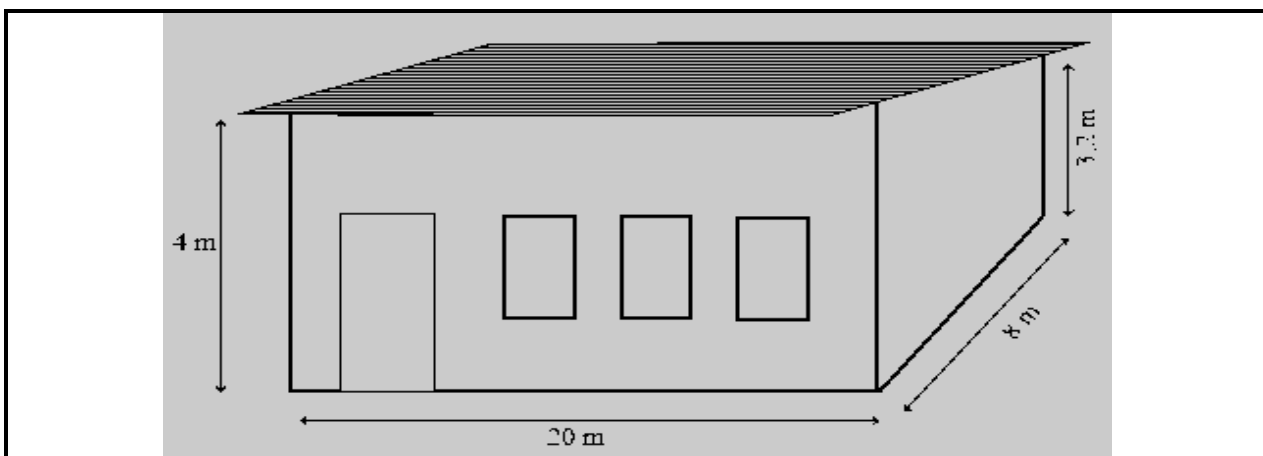
- 4×100 g for R22,99
- 3×175 g for R26,99



(3)
[30]

QUESTION 2

The community members of a rural school decided to paint the outside walls of the school hall during their free time and at their own cost. The dimensions of the hall are given below:

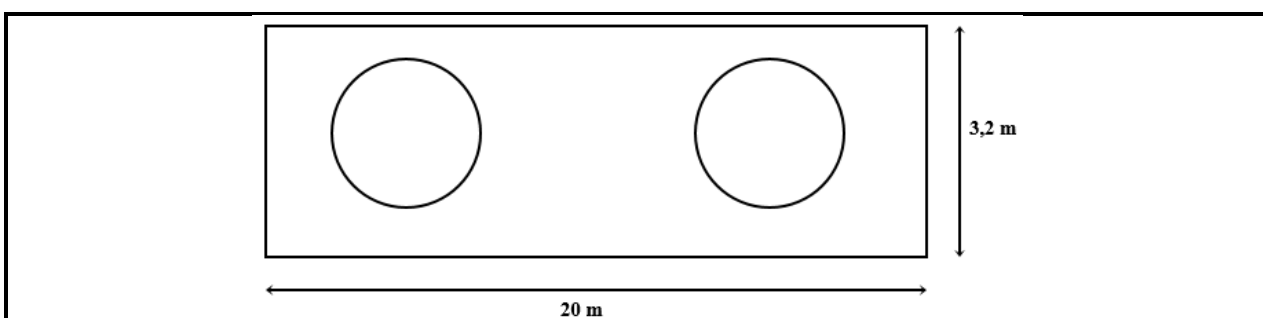


The hall has four walls, a front facing wall, two side walls and a back wall. The front facing wall has a door and three windows with the following dimensions:



- The height of the door is 2,5 metres
- Each window has a height 1,2 metres and a width of 0,5 metres

The back wall of the hall has two circular windows as shown below:



Study the above information to answer the questions.



2.1 The area of the door is $2,25 \text{ m}^2$.

Determine the width of the door.



Formula: $\text{area} = \text{height} \times \text{width}$

(4)

2.2 Calculate the total area of the front facing wall that will be painted.

Formula: area = length \times height



(6)

2.3 Calculate the total area of the two side walls.

Formula: Total area = width of wall \times (height of front wall + height of back wall)

(4)

2.4 The circumference of one circular window is 4,7728 metres.

Determine the radius of the window. Give your answer in centimetres.

Formula: circumference = $2 \times \pi \times r$, where $\pi = 3,14$

(5)

2.5 Calculate the total area of the two circular windows in m².

Formula: area of circle = $\pi \times r^2$, where $\pi = 3,14$



(3)

2.6 The total area of the outside walls is 251,52 m². One litre of exterior wall paint will cover 8 m² of the outside walls.

Calculate the number of litres of exterior wall paint that must be bought to paint the outside walls of the school hall with two coats of paint. (Round off your answer to the nearest litre.)

(5)

2.7 Exterior wall paint is sold in 20 ℓ and 5 ℓ containers. The exterior wall paint costs R749 for 20 ℓ and R279 for 5 ℓ. The local church buys two 20 ℓ and two 5 ℓ containers of exterior paint.

Calculate the total cost of the paint.





(3)

[30]

QUESTION 3

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


COLUMN A		COLUMN B	
3.1.1	Retirement annuity	A	a rate charged for a household service
3.1.2	Overdraft	B	the official measure of inflation in South Africa
3.1.3	Tariff 	C	an insurance that covers medical expenses
3.1.4	CPIX	D	paying towards an investment until reaching a pre-defined retirement age
3.1.5	Medical aid	E	a return on investment 
		F	withdrawal of money that is greater than the amount of money in the bank account

(5 \times 1)

(5)



3.2 The till slip below shows the purchases made by Mrs Jones at Megab Foods.



MEGAB FOODS		
Welcome to our Store		
Shop 10, Cnr Centre		
Umzinto, South Africa		
VAT REG No: 45501321		
Customer Help Line: 0860012012		
LAST DAY FOR A FULL REFUND IS 17/06/2019		
SANDWICH WHITE BREAD	14.99	
CLOVER MILK 2ℓ	25.99	#
FR JUMBO EGGS	31.99	#
24 LITRE RECYCLABLE	0.62	
STICKY RIBS	170.23	
LEAN BEEF MINCE	52.73	
MIXED VEGETABLES	23.93	#
24 LITRE RECYCLABLE	0.62	
DUE VAT INCL	321.10	
FNB	321.10	
ACCOUNT NUMBER*****1327		
AUTH: 200045		
CHANGE	0.00	
-----TAX INVOICE-----		
	TAXABLE VALUE	VAT 15%
VAT INCL	207.99	31.20
# ZERO - RATED	81.91	0.00

10/06/19	14:36	CASHIER: FAIZAL KHAN
THANK YOU FOR SHOPPING WITH US		

Study the till slip to answer the questions.



- 3.2.1 When did Mrs Jones make the the above purchase? (Give the date and time)  (2)
- 3.2.2 How are the zero-rated items indicated on the till slip? (1)
- 3.2.3 What does zero-rated mean? (1)
- 3.2.4 What form of payment did Mrs Jones use? (1)
- 3.2.5 If lean beef mince was R115,75 per kilogram, what was the weight of the lean mince that Mrs Jones bought? Round off your answer correctly to one decimal.  (4)
- 3.2.6 Show, by calculations, how the taxable value of R207,99 was calculated. (5)

- 3.3 Mrs Jones plans to take an education insurance policy for her daughter. An insurance agent offered her the following policy:

Start date	1 May 2019
Maturity date	1 November 2031
Initial monthly contribution	R483,29
Payment frequency	Monthly
Payment method	Debit order
Maturity value: low performance rate	R116 713,39
Maturity value: high performance rate	R170 887,43



Study the above education policy to answer the questions.

- 3.3.1 What is a debit order? (1)
- 3.3.2 Calculate the difference between the two maturity values. (2)
- 3.3.3 Show, by calculations, that Mrs Jones will pay her contributions over 150 months, if she took the policy.  (4)
- 3.3.4 Determine the total value of contributions at maturity, if the monthly contribution remains the same. (2)
- 3.3.5 If the monthly contribution is expected to increase by 7,9% in the second year, calculate the new monthly debit order for that year.  (2)
- [30]**

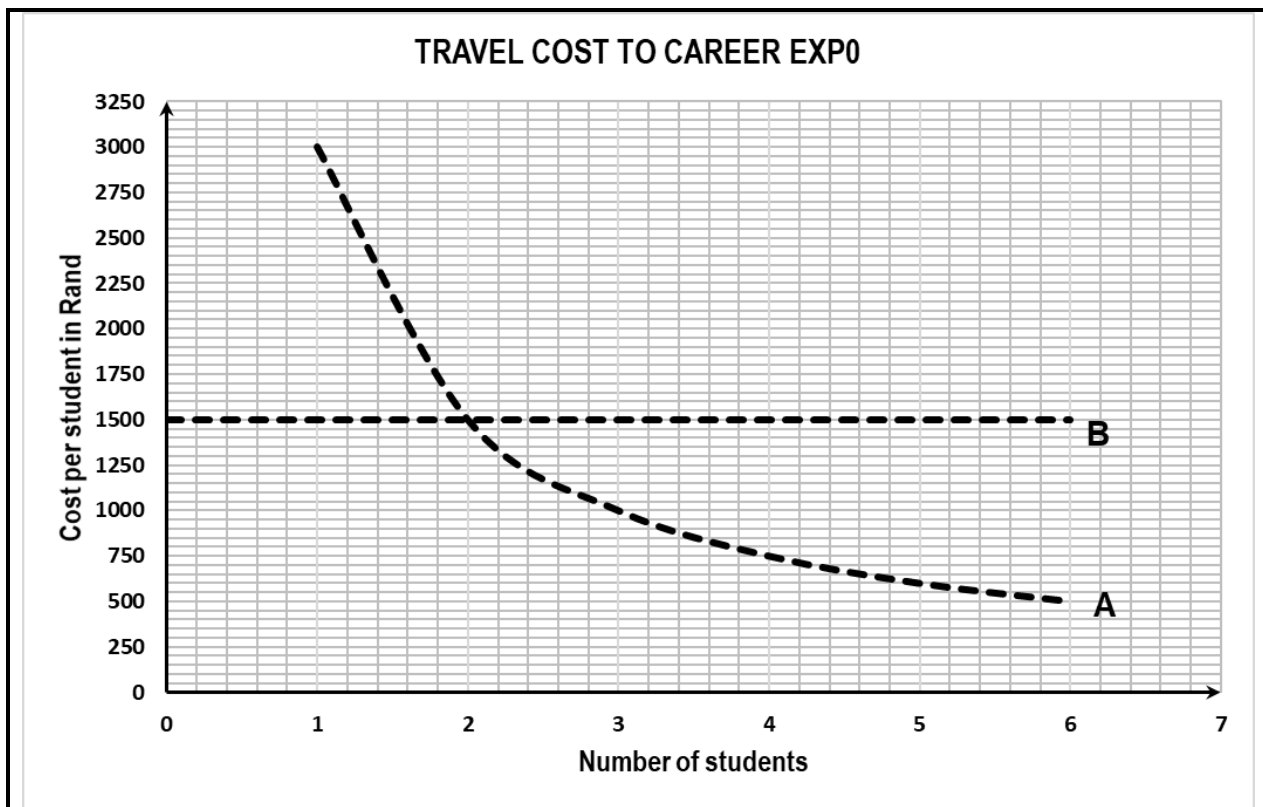
QUESTION 4

4.1 A group of sales and marketing students decided to go to a career expo. The following two travel options were available to them:



- Hire an SUV that can seat up to six passengers for a flat rate of R1 500, OR
- Use a friend's bakkie that can also seat six passengers, at a total cost of R3 000

The graphs A and B below, represents the above options:



Study the above information and graph to answer the questions.



- 4.1.1 Which graph represents the SUV and which graph represents the bakkie? (2)
- 4.1.2 Determine the total travel cost in rand, if five students travel by SUV. (2)
- 4.1.3 Determine the total travel cost in rand, if five students travel by bakkie. (2)
- 4.1.4 Derive a formula for GRAPH A. (3)
- 4.1.5 Derive a formula for GRAPH B. (2)
- 4.1.6 Give the coordinates at which the total travel costs of using either the SUV or the bakkie is the same. (2)
- 4.1.7 What type of relationship does GRAPH A represent? Give a reason for your answer. (2)
- 4.1.8 What type of relationship does GRAPH B represent? Give a reason for your answer. (2)

- 4.2 Siyabonga recently qualified with a diploma. After numerous job applications he received two job offers as a sales representative. The wages of each option are given below:

Option A: R5 000 plus R350 per day for each day he works in a month

Option B: R600 per day for each day he works per month



The formula for option A is: wages = R5 000 + R350 × number of days worked

The formula for option B is: wages = R600 × number of days worked

Number of days worked	0	5	10	15	25
Wages in (R): option A	5 000	6 750	8 500	10 250	13 750
Wages in (R): option B	0	3 000	6 000	9 000	15 000

Study the above information and table to answer the questions.

- 4.2.1 Use the above table to draw and label TWO line graphs for OPTION A and OPTION B on the grid in ANSWER SHEET 1 (attached). Label each graph clearly. (10)
- 4.2.2 After how many days will the wages for OPTION B be more than the wages for OPTION A? (1)
- 4.2.3 Give TWO reasons why OPTION A does not represent a direct proportion relationship. (2)




[30]

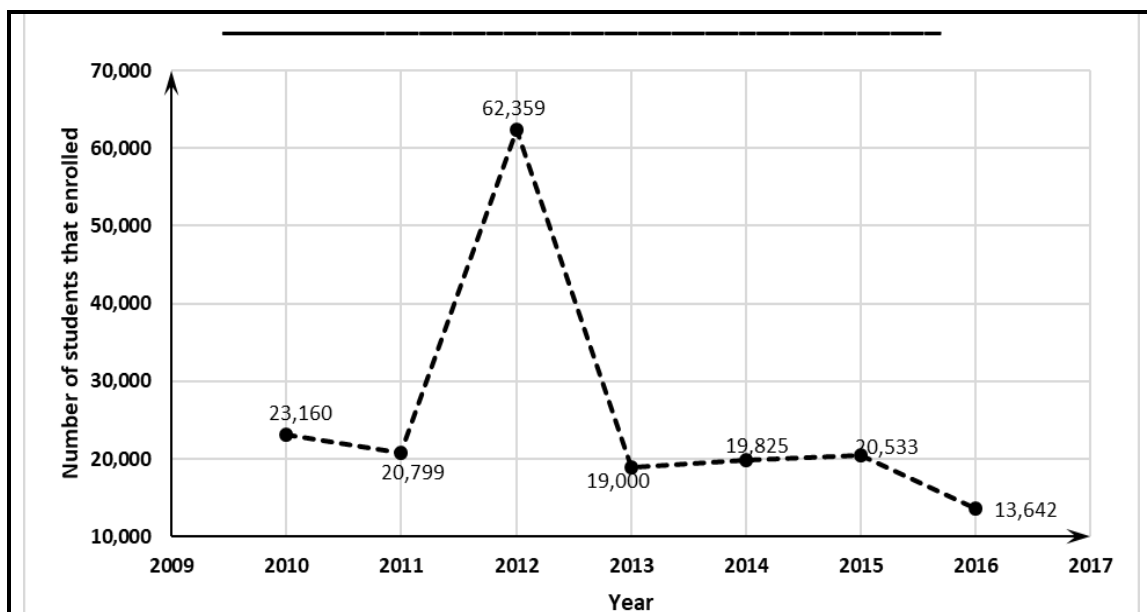
QUESTION 5

The table below compares the number of students enrolled in TVET colleges from 2010 to 2016. Study the table to answer the questions.



Programme	Year						
	2010	2011	2012	2013	2014	2015	2016
NC(V)	130 039	124 658	140 575	154 960	166 433	165 459	177 261
Report 191	169 774	222 754	359 624	442 287	486 933	519 464	492 026
CBMT	23 160	20 799	62 359	19 000	19 825	20 533	13 642
Other	35 420	A	95 132	23 371	29 192	32 424	22 468
Total	358 393	400 273	657 690	639 618	B	737 880	705 397

[Adapted from: www.dhet.gov.za]

- 5.1 Calculate the values of A and B.  (2×2) (4)
- 5.2 In which year did CBMT experience the lowest enrolment? (2)
- 5.3 Describe the trend of enrolments for Report 191 from 2010 to 2015. (2)
- 5.4 Describe the trend of enrolments in the qualification category 'other' from 2010 to 2016. (2)
- 5.5 Calculate the range of enrolments in CBMT from 2010 to 2016. (2)
- 5.6 Calculate the median of enrolments in CBMT from 2010 to 2016. (3)
- 5.7 Calculate the mean of enrolments in CBMT from 2010 to 2016.  (4)
- 5.8 Calculate the percentage decrease of student enrolments in TVET colleges between 2015 and 2016. (5)
- 5.9 The graph below shows the number of students that enrolled for CBMT from 2010 to 2016: 



Study the above graph to answer the questions.

- 5.9.1 Give a suitable heading for the graph.  (1)
- 5.9.2 Why is the above graph drawn as a broken line? (2)
- 5.9.3 In which year was the enrolment for CBMT unproportionately higher? What is the name given to such a data value? (2)
- 5.9.4 Give a reason as to why the above graph is misleading.  (1)

[30]

TOTAL: 150

ANSWER SHEET EXAMINATION NUMBER:

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QUESTION 4.2.1

