



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY

(Second Paper)

NQF LEVEL 3

(10401023)

22 February 2018 (X-Paper)

09:00 – 12:00

Calculators may be used, unless stated otherwise.

This question paper consists of 9 pages and 2 addenda.

TIME: 3 HOURS
MARKS: 150

INSTRUCTIONS AND INFORMATION

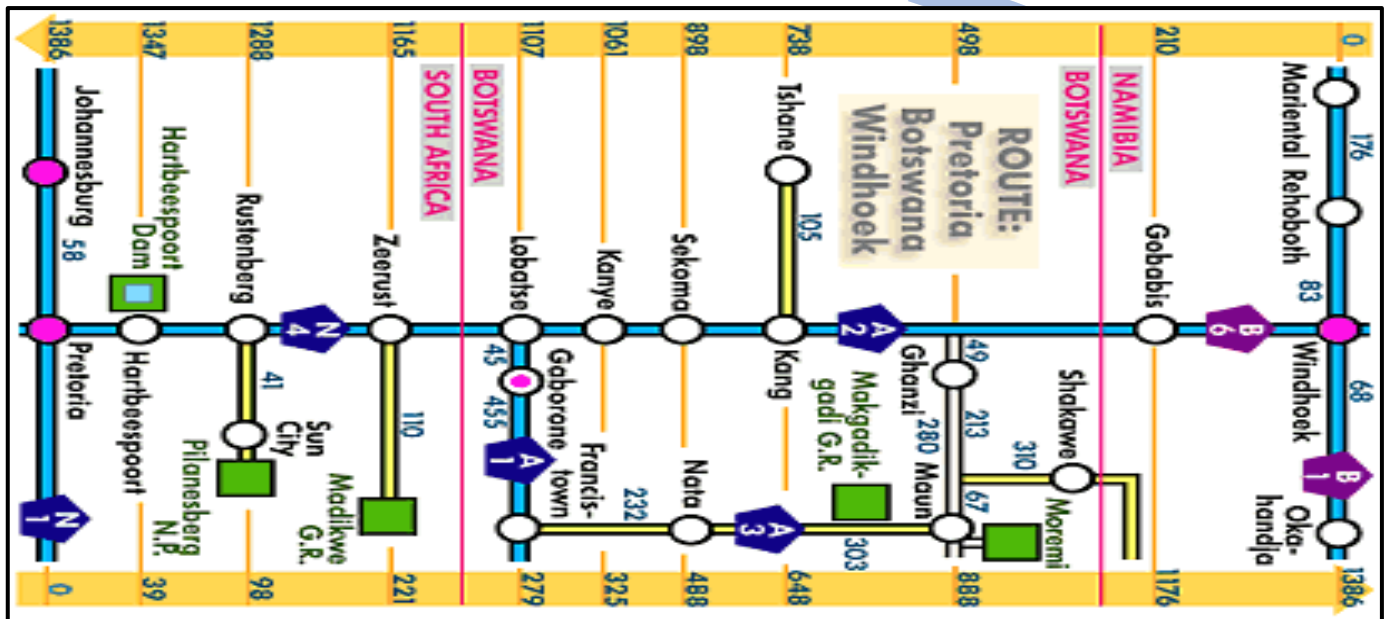
1. Answer ALL the questions.
 2. Read ALL the questions carefully.
 3. Number the answers according to the numbering system used in this question paper.
 4. You may use an approved calculator (nonprogrammable and nongraphic), unless stated otherwise.
 5. Show ALL calculations clearly.
 6. Round off your 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. Maps and diagrams are NOT necessarily drawn to scale, unless stated otherwise.
 9. Answer QUESTION 2.2 on attached ADDENDUM A and answer QUESTION 3.7 on attached ADDENDUM B. Write your EXAMINATION NUMBER in the space provided and hand in the ADDENDA with your ANSWER BOOK.
 10. Write neatly and legibly.
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QUESTION 1

1.1 Mary drives a delivery truck for Express Courier Services. She delivers throughout South Africa and other neighbouring countries in Southern Africa.



Given below is a strip map showing the routes and distances that Mary uses in kilometres.



Study the strip map to answer the following questions:

1.1.1 Name the three countries included in the strip map. (3)

1.1.2 Determine the distance in kilometres between Rustenburg and Tshane. (5)

1.1.3 The courier vehicle has an average fuel consumption of 7 litres per 100 km and diesel costs R12,57 per litre.

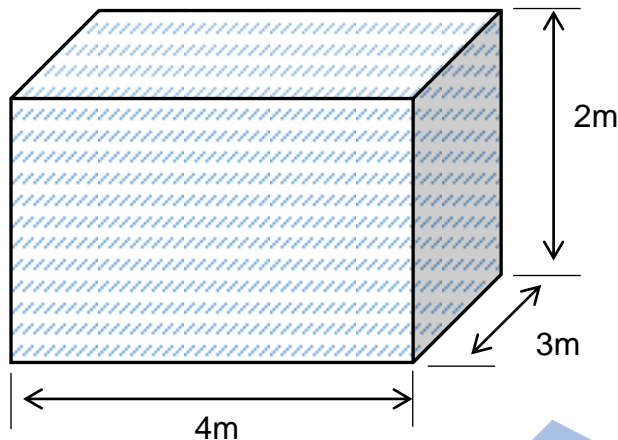
Calculate the cost of diesel if the courier vehicle has to complete the journey from Pretoria to Gobabis. (6)

1.1.4 If Mary travels at an average speed of 95 km/h, calculate the time it will take her to travel from Pretoria to Lobatse.

Round off your answer to the nearest hour.

Formula: Distance = speed × time (5)

- 1.2 A farmer uses water from a borehole to fill up a rectangular steel reservoir. The sketch below shows the dimensions of the reservoir.



Study the sketch of the steel reservoir to answer the following questions:

- 1.2.1 Calculate the volume of the steel reservoir in litres if $1 \text{ m}^3 = 1\,000$ litres.

Formula: $\text{Volume} = \text{Length} \times \text{Breadth} \times \text{Height}$ (4)

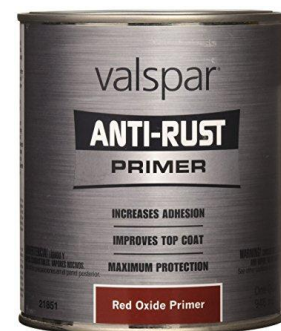
- 1.2.2 Calculate the time it will take to fill the steel reservoir if the borehole water flows at a rate of 60 litres per minute. Write your answer in hours and minutes. (5)

- 1.2.3 The steel used to build the reservoir costs R670 per m^2 . Calculate the total cost of the steel used to build the reservoir if it is closed on all sides. (7)

$\text{Area} = 2(\text{Length} \times \text{Breadth}) + 2(\text{Length} \times \text{Height}) + 2(\text{Breadth} \times \text{Height})$ (7)

- 1.2.4 The farmer purchased anti-rust primer, in containers, to paint the inside and outside of the steel reservoir.

If a container of anti-rust primer covers an area of at least 12 m^2 , determine the number of containers of anti-rust primer required to paint the entire steel reservoir inside and outside.



(5)
[40]

QUESTION 2

2.1 The students at a private College pay a Student Representative Council (SRC) levy during every registration cycle. This levy is used by the SRC to coordinate activities such as sports, wellness, field trips, academic support and cultural activities, etc.

The SRC levy is charged at **R150,00**, **R75,00** and **R50,00** for NCV, Semester and Trimester students respectively. The table below shows the total projected number of students, per programme, that were expected to enrol at the private college in 2017.



PROGRAMME	NUMBER OF STUDENTS			TOTAL	SRC Levy
NCV	Year Course 1 600			1 600	R150
Semester	Semester 1 1 400	Semester 2 1 400		2 800	R75
Trimester	Trimester 1 1 700	Trimester 2 1 700	Trimester 3 1 700	5 100	R50
GRAND TOTAL				9 500	

Study the above information to answer the following questions:

2.1.1 Calculate the projected SRC income from NCV student enrolments for the 2017 academic year. (2)

2.1.2 January enrollments include the Year Course, Semester 1 and Semester 2.

Calculate the total number of students that were expected to enrol in January 2017? (5)

2.1.3 Calculate the projected SRC income from the expected January 2017 student enrolments. (4)

2.1.4 Show, by calculations, that the total expected SRC income from enrolments for the entire 2017 academic year is R705 000,00. (5)

2.2 The actual expenses of the SRC for the 2017 academic year are shown below:

SRC Benefits paid	: R53 000,00
Sports Equipment	: R82 000,00
Stationery	: R1 470,00
Sundry	: R950,00
Trips	: R144 500,00
Cultural Activities	: R160 800,00
Academic Support	: R400 300,00
HIV/AIDS and Wellness	: R145 900,00

Use the above information to complete the budget template found in ADDENDUM A (attached).

Formula: Variance = Planned Expenses – Actual Expenses (20)

2.3 The sporting equipment was purchased at a price of R82 000,00 after a discount of 10%.

Calculate the original price of the sporting equipment.

(4)
[40]

QUESTION 3

Smith plants and sells grass. He pays a monthly rent of R1 500,00 for municipal land and a further R300,00 to produce one pallet of grass. Smith sells a pallet of grass for R700,00.



The table below shows Smith's monthly cost and income for growing and selling of grass in pallets.

Pallets of grass	0	1	2	A	4	5
Monthly Cost in rand (R)	1 500	1 800	2 100	2 400	B	3 000
Monthly Income in rand (R)	0	700	1 400	2 100	2 800	C

Pallet



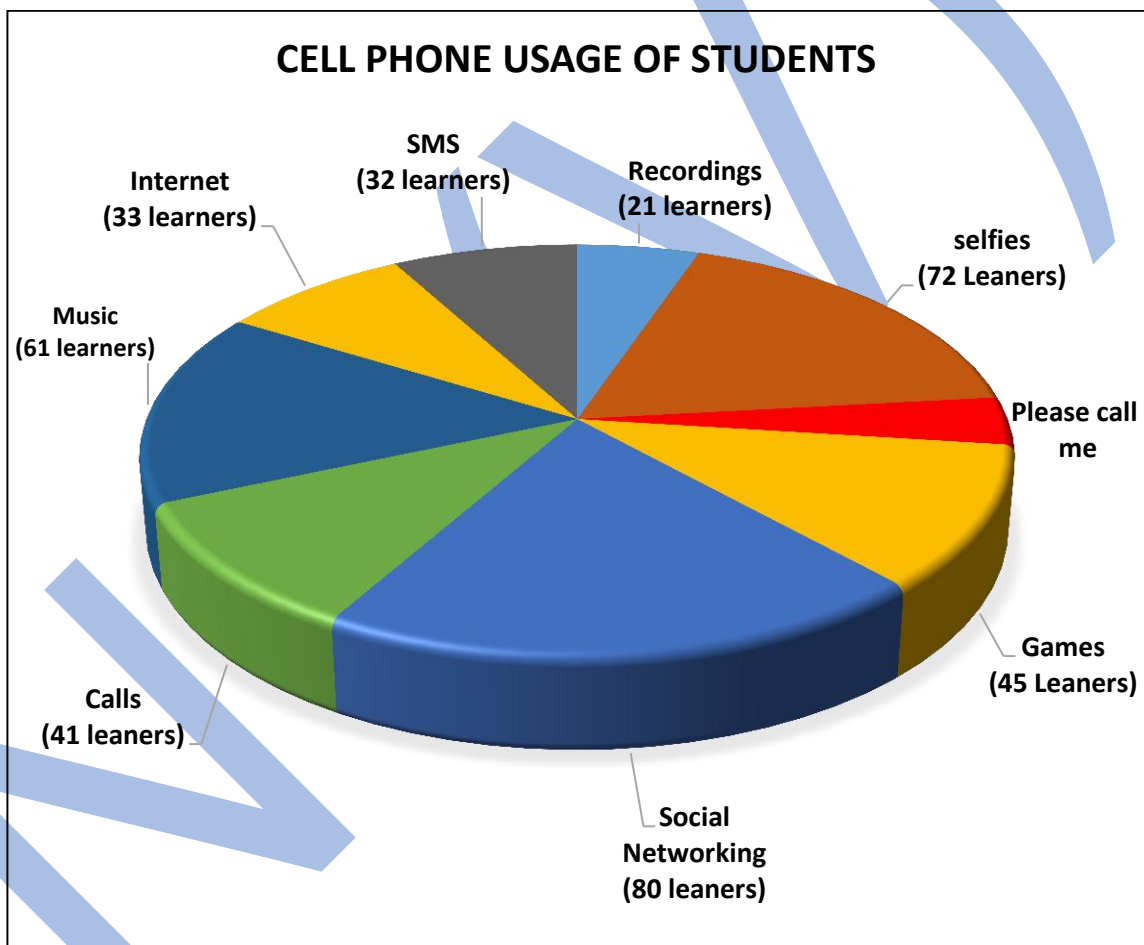
Study the above information to answer the questions that follow:

- 3.1 Use any method to determine the values of **A**, **B** and **C**. (3)
- 3.2 Derive a formula to calculate the monthly cost of producing pallets of grass. (3)
- 3.3 Derive a formula to calculate the monthly income from selling pallets of grass. (2)
- 3.4 Use the formula in QUESTION 3.2 to calculate the cost of growing 20 pallets of grass in a month. (3)
- 3.5 Use the formula in QUESTION 3.3 to calculate Smith's monthly income if he sells 20 pallets of grass. (2)
- 3.6 If the monthly cost of growing grass is R13 800,00, determine the number of pallets of grass grown. (4)
- 3.7 Use the information in the above table to draw and label two line graphs on the grid found in ADDENDUM B (attached). Label the graphs as cost and income. Label the horizontal and vertical axes and provide a suitable heading for the graphs. (9)
- 3.8 Use the graphs in QUESTION 3.7 to determine the minimum number of pallets of grass that Smith must sell in a month to make a profit. (2)

- 3.9 If Smith sells only two pallets of grass in a month, will he make a profit or a loss. Show all calculations. (3)
 - 3.10 Calculate the profit in rands if Smith sells 50 pallets of grass in a month. (4)
- [35]**

QUESTION 4

4.1 The communications officer at a TVET College conducted a survey amongst 400 students to find out for what the students mostly used their cell phones. Each student had to choose only one option. The results of the survey are shown in the pie chart below.



Study the above pie chart to answer the questions.

- 4.1.1 For what do students mostly use their cell phones? (1)
- 4.1.2 How many students use their cell phones to request a 'please call me'? Show your calculations. (3)
- 4.1.3 How many more students were found to be using their cell phones for Social Networking than for browsing the internet? (3)
- 4.1.4 What percentage of students use their cell phones for taking selfies? Show all calculations. (3)


4.1.5 What is the probability that a student chosen at random will be using his/her cell phone for Social networking? Write the answer in its simplest fraction form. (3)

4.1.6 Why is the pie chart above not the most suitable graph to represent the results of the survey? (2)

4.2 The communications officer collected further data from the 80 students who use their cell phones most for social Networking. The students had to complete a questionnaire that requested their gender and the social network used.

The table below represents the data collected:

Number of students using Social Networks by gender.			
Social Networks	Males	Females	TOTAL
Facebook	23	33	56
Twitter	5	14	A
WhatsApp	36	44	80
Instagram	7	4	11
YouTube	B	18	40



Use the above table to answer the questions that follow:

4.2.1 Determine the values of **A** and **B**. (4)

4.2.2 Which Social Network did all students in the survey use? (2)

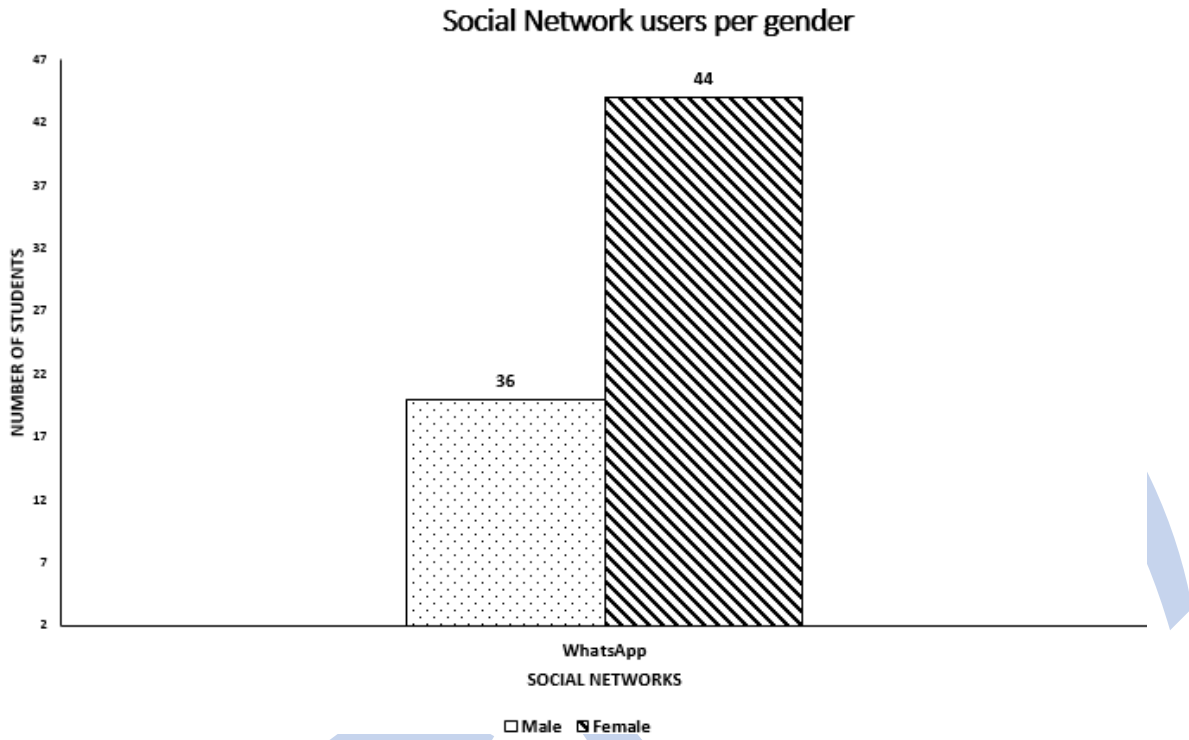
4.2.3 Is the following statement true: 'Some students were found to be using more than one Social Network'? Give a reason for your answer. (3)

4.2.4 What is the probability that a male student chosen at random uses WhatsApp? Write down your answer in its simplest decimal form. (3)

4.2.5 Name two Social Networks which have more male users than female users. (2)

4.2.6 What type of graph will best represent the information in the above table? Give two reasons for your answer. (3)

4.3 The double bar graph below shows the number of male and female students that use WhatsApp:



Is the above graph misleading? Give two reasons to support your answer.

(3)
[35]

TOTAL: 150

ADDENDUM A EXAMINATION NUMBER:

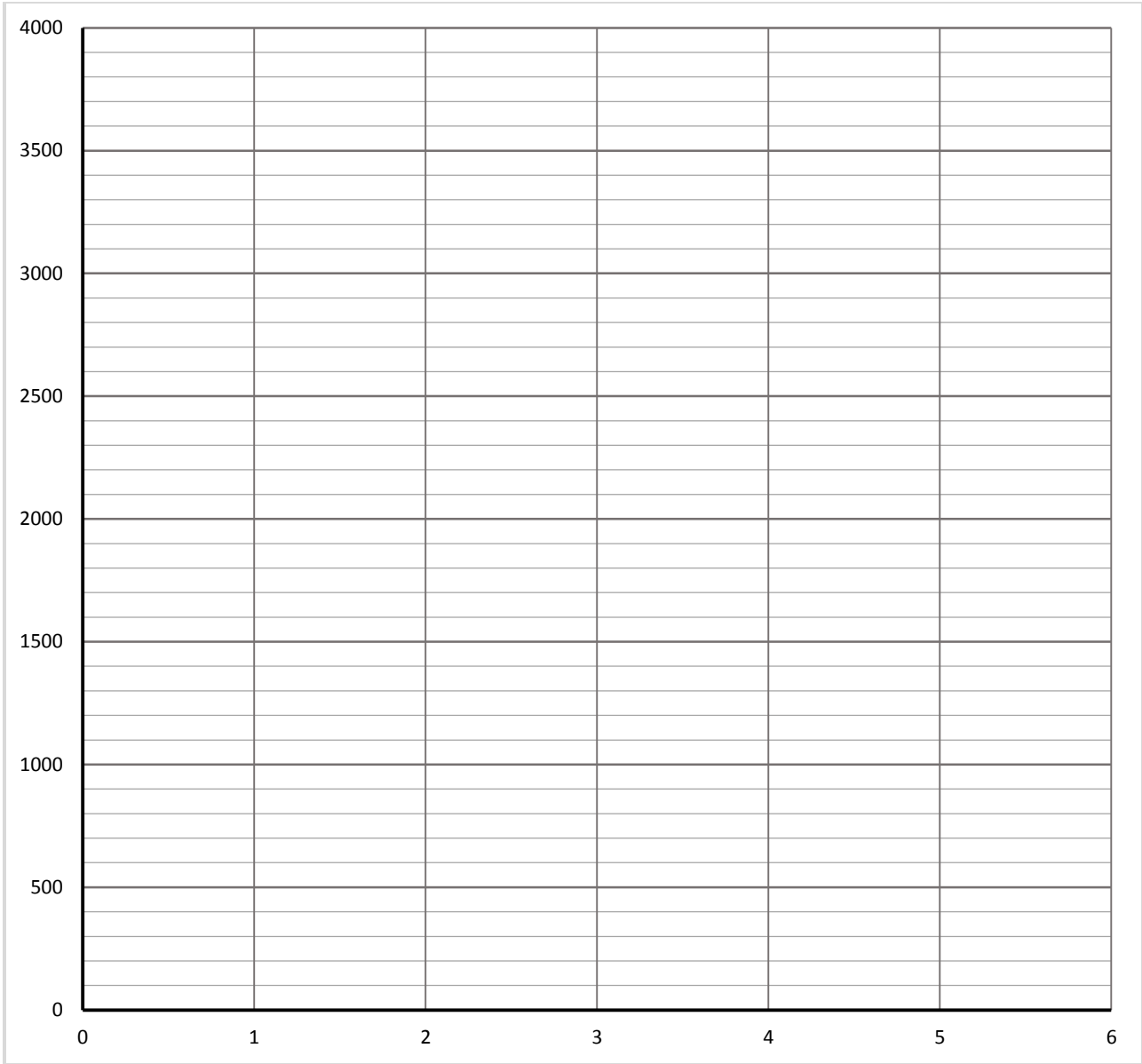
QUESTION 2.2

SRC BUDGET

Item No:		Budget (Planned)	Actual (Realised)	Variance
	INCOME:	R	R	R
1	SRC Fund	705 000	700 000	-5 000
2	College Subsidy	400 000	400 000	0
3	TOTAL INCOME	1 105 000	1 100 000	-5 000
	EXPENSES:	R	R	R
4	Academic Support	400 000	400 300	- 300
5	Cultural Activities	170 000		
6	Trips	150 000		
7	Sundry	1 000		
8	HIV/AIDS and Wellness	150 000		
9	SRC Benefits	54 000		
10	Stationery	1 000		
11	Sports Equipment	80 000		
12	TOTAL EXPENSES			
13	SURPLUS/DEFICIT			

ADDENDUM B EXAMINATION NUMBER:

QUESTION 3.7



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