



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY

(First Paper)

NQF LEVEL 3

(10401023)

4 November 2019 (X-Paper)

09:00–12:00

Nonprogrammable calculators may be used.

This question paper consists of 11 pages and 3 answer sheets.

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. 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 3.2 on ANSWER SHEET 1, QUESTIONS 4.1.7 and 4.1.8 on ANSWER SHEET 2 and QUESTION 5.1.1 on ANSWER SHEET 3. 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 $234 + 84 \div 2$ (2)

1.1.2 $0,5(3,8 + 1,5) - 2,35$ (3)

1.1.3 $\sqrt{64} + (-4)^2$  (2)


1.2 Mabaso has R140, Thabo has R70 and Ally has R35. What is the ratio of the amount of money Mabaso has, to the amount of money Thabo has and to the amount of money Ally has? Write the ratios in simplest form. (3)

1.3 The price of a steel table is R750. On Black Friday the table could be bought for R600.
Calculate the percentage discount? Show ALL your calculations. (3)

1.4 Convert 125 g to kilograms.
(1 kg = 1 000 grams)  (2)

1.5 The VAT inclusive price of a TV is R2 700. VAT is calculated at 15%.
Calculate the VAT amount of the TV. (3)

1.6 A green grocer packs 12 apples in a plastic bag. Calculate the number of bags he will need if he has 285 apples. (3)

1.7 The scale of a map is 1 : 500 000. Determine the actual distance in km if the measurement on the map is 23,7 cm. 
Hint: 1 km = 100 000 cm (3)

1.8 A cake was baked from 11:20:00 to 12:05:30.
Calculate the time taken to bake the cake. Give your answer in minutes and in seconds. (2)

1.9 A box of printing paper costs R269. There are FIVE reams of printing paper in ONE box. A ream consists of 500 sheets of printing paper.



1.9.1 Calculate the number of sheets of printing paper in ONE box. (1)

1.9.2 Calculate the cost of ONE sheet of paper? Give your answer in cents per sheet. (3)

[30]

QUESTION 2

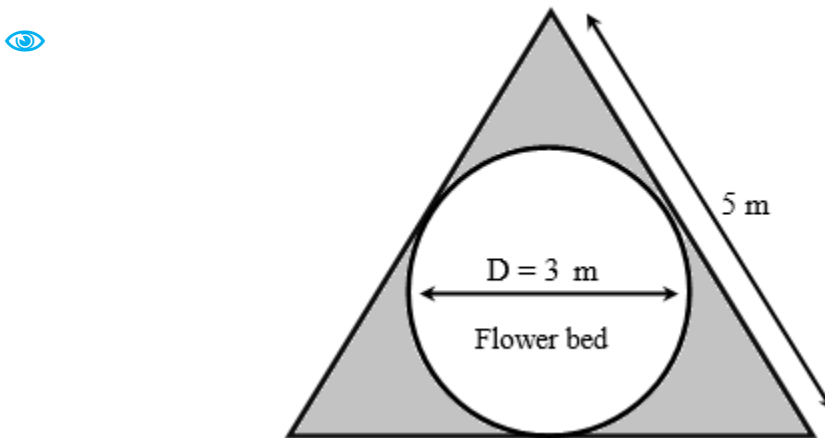
- 2.1 Choose a description from COLUMN B that matches a word in COLUMN A. Write only the letter (A–F) next to the question number (2.1.1–2.1.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
2.1.1	Area	A	A photo frame 140 mm × 210 mm .
2.1.2	Perimeter	B	The diagram of a building.
2.1.3	Plan	C	The measurement needed to tile a floor.
2.1.4	Square	D	The distance around a soccer field.
2.1.5	Rectangular shape	E	Measured in cm ³ .
		F	A 2-dimensional object with all sides equal.

(5 × 1)

(5)

- 2.2 A circular flower bed in a triangular-shaped garden is shown in the sketch below. The diameter of the flower bed is 3m, and each side of the triangular-shaped garden is 5 m. The shaded portion of the garden is covered with lawn (grass).



Study the above sketch to answer the questions that follow:

- 2.2.1 Calculate the radius of the flower bed. (1)
- 2.2.2 Calculate the area of the flower bed. Round off your answer correct to two decimal places. (2)
- Formula: Area = πr^2 , where $\pi = 3,14$ (3)
- 2.2.3 If the area of the triangular garden is 10,825 m², calculate the area of the lawn (grass). (2)
- 2.2.4 Calculate the perimeter of the triangular garden. (2)

2.3 A paraffin container has a diameter of 300 mm and a height of 744 mm.




Study the above picture to answer the questions that follow:

2.3.1 Calculate the volume of a container in cm^3 .

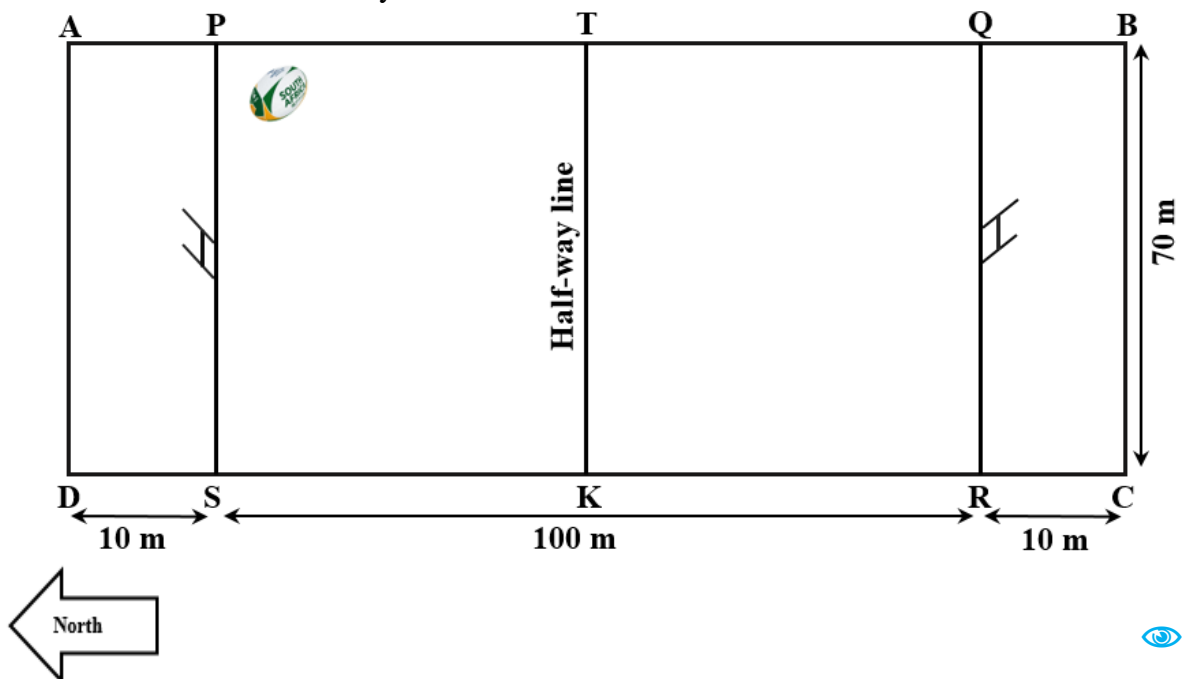
Use the Formula: $V = \pi r^2 h$, where $\pi = 3,14$ (4)

2.3.2 Convert the answer in QUESTION 2.3.1 into litres.



(1 000 $\text{cm}^3 = 1$ litre) 

Round off your answer to the nearest litre. (2)

2.4 A rugby field ABCD that was used during the Rugby World Cup 2019 is shown below. The dimensions DS is 10 metres, SR is 100 metres and RC is 10 metres. The compass direction in relation to the field is shown by the arrow below.




Study the above diagram to answer the questions that follow:

- 2.4.1 Calculate the length of the rugby field AB.  (2)
- 2.4.2 Calculate the area of the rugby field ABCD. (3)
- 2.4.3 Determine the length of SK in metres. (1)
- 2.4.4 A ball is kicked from point K to point P. Calculate the straight line distance the ball was kicked in metres. Round off your answer to the nearest metre.
- Hint: Determine the length of KP.
-  Formula: $KP^2 = PS^2 + SK^2$ (4)
- 2.4.5 If an assistant referee stands at point K and faces the rugby field, in which compass direction would he be facing? (1)


[30]

QUESTION 3


- 3.1 Suzan runs a business (Suzan's Multi Services). She purchased items for her new office and received the tax invoice. Study the tax invoice and answer the questions that follow: 

Melsetter's Carpets & Fabric Shop 7 Bloem Mall P.O. Box 2015 BLOEMFONTEIN 9300		Tel 051 291 0510 Fax 051 261 0512 e-mail melf@mail.com	
TAX INVOICE			
16/07/2018			
Invoice No. 20180716-241			
Item	Quantity	Unit Price	Amount
Carpet	15 m ²	R158 per m ²	3.1.3 (a)
Chairs	3	3.1.3 (b)	R960,00
Curtains	4	R799,99	R3 199,96
Total excluding VAT			R6 529,96
VAT @ 15%			3.1.3 (c)
Total including VAT			3.1.3 (d)

Study the above tax invoice to answer the questions that follow:


- 3.1.1 On which date was the invoice issued?  (1)
- 3.1.2 Write down the tax invoice number. (1)

3.1.3 Calculate the following:

- (a) The Amount in rands, for 15 m² of carpet before VAT. (2)
- (b) The Unit Price of ONE chair before VAT was added. (2)
- (c) The VAT amount in rands.  (2)
- (d) The Total including VAT in rands. (2)

3.2 Suzan developed a budget and variance report for the 1st quarter of 2019. Information on the budget and variance report is provided below. Additional information is on ANSWER SHEET 1:

Rent	R 9 000
Landline and cell phone	R 2 950
Stationery and printer toner	R 1 550
Water and electricity	R 4 525
Wages	R29 600
Vehicle fuel & maintenance	R15 623
Other	R 325

Use the information above to complete the budget and variance report provided in ANSWER SHEET 1. 


- Complete values (a) to (h) on the budget and variance report.
- Indicate on the report whether it reflects a SURPLUS or a DEFICIT by ringing the correct word (SURPLUS/DEFICIT) as your answer.

Write your EXAMINATION NUMBER on ANSWER SHEET 1 and hand it in with your ANSWER BOOK. (9)

3.3 Innocent Moeti works for Suzan's Multi Services. His pay slip is displayed below. The missing values on the pay slip are numbered according to the questions that need to be answered.

PAY SLIP			
Bank details: ABC		Account number: 234 612 54	
Payment period: 01/07/2019-31/07/2019			
Name of employer		Suzan's Multi Services	
Address		123 Anywhere street, Bloemcastle	
Name of Employee		Innocent Moeti	
ID No: 710727098374		Employee Number: 0001	
Income in rands	Amount	Deductions	Amount
Basic Salary:	R9 000,00	PAYE	R 863,09
Commission earned (5% of sales)	R5 986,61	UIF (1% of gross)	3.3.3
Gross Salary:	3.3.1	Total deductions:	R1 012,96
		Net salary:	3.3.4



- 3.3.1 Calculate Innocent's gross salary. (2)
- 3.3.2 What does "PAYE" stand for? (1)
- 3.3.3 UIF is calculated at 1% of the gross salary.
Calculate the amount deducted for UIF. (2)
- 3.3.4 Calculate Innocent's net salary.  (2)
- 3.3.5 The payslip states "Commission earned (5% of sales)". If Innocent earned R5 986,61 commission, calculate the value of sales for July. (4)
- [30]**

QUESTION 4

- 4.1 Susan uses the tables below to help her in decision making concerning transport for her business. TABLE 1 represents the cost of petrol per litre and TABLE 2 represents the speed and time taken to complete a set journey.



TABLE 1:


Number of litres of petrol	1	2	3	4	5
Cost in Rand	R15	R30	R45	A	R75

TABLE 2:

Speed in km/h	40	60	90	100	120
Time in hours	4,5	3	2	1,8	B

Study the above tables to answer the questions that follow:

- 4.1.1 Use the information and the tables above to extend the numerical patterns by completing the missing values **A** and **B**. Write only the answer next to the letter (A–B) in the ANSWER BOOK.  (4)
- 4.1.2 Derive a formula for the relationship represented in TABLE 1. (2)
- 4.1.3 How many litres of petrol can Susan buy with R255? Show all calculations. (3)
- 4.1.4 State whether TABLE 1 represents direct or indirect relationship. Give a reason for your answer. (2)
- 4.1.5 State whether TABLE 2 represents direct or indirect relationship. Give a reason for your answer.  (2)
- 4.1.6 Derive a formula for the relationship represented in the TABLE 2. (3)

- 4.1.7 Use TABLE 1 above to plot and draw a line graph on the grid found in ANSWER SHEET 2 (attached). Label the horizontal and vertical axes and provide a suitable heading for the graph.  (6)
- 4.1.8 Use TABLE 2 above to plot and draw a line graph on the grid found in ANSWER SHEET 2 (attached). Label the horizontal and vertical axes and provide a suitable heading for the graph. (6)
- 4.1.9 If Susan drives at a speed of 150km/h, how long will it take to complete the journey. Give your answer in hours and minutes. (2)
- [30]**


QUESTION 5

- 5.1 The SRC did a survey to find out which social media NCV students prefer to use to communicate with one another. Given below are the responses from the sample that was surveyed.

KEY	
FB	: Facebook
TW	: Twitter
IS	: Instagram
WA	: WhatsApp
EM	: e-Mail



FB, TW, TW, TW, FB, IS, EM, TW, WA, IS, IS, EM, TW, FB, IS, TW, WA, WA, TW, EM, TW,
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- 5.1.1 Use the above data to complete the frequency table found in ANSWER SHEET 3 (attached).  (6)
- 5.1.2 According to this survey, which social medium is preferred by most of the students? (1)
- 5.2 The number of male and female students that were enrolled in different programmes at a TVET College are listed below:

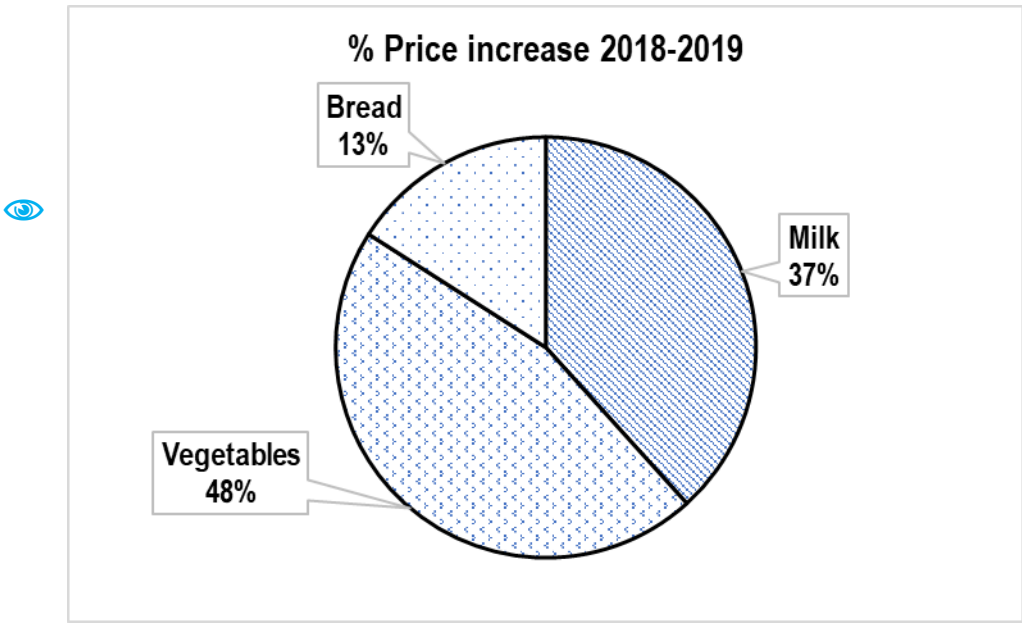
Programme	No. of Male Students	No. of Female Students
Marketing	105	145
Tourism	100	200
Management	190	160
Hospitality	70	250
Finance, Economics and Accounting	100	50
Office Administration	40	280
Information Technology & Computer Science	110	40



Use the above graph to answer the questions.

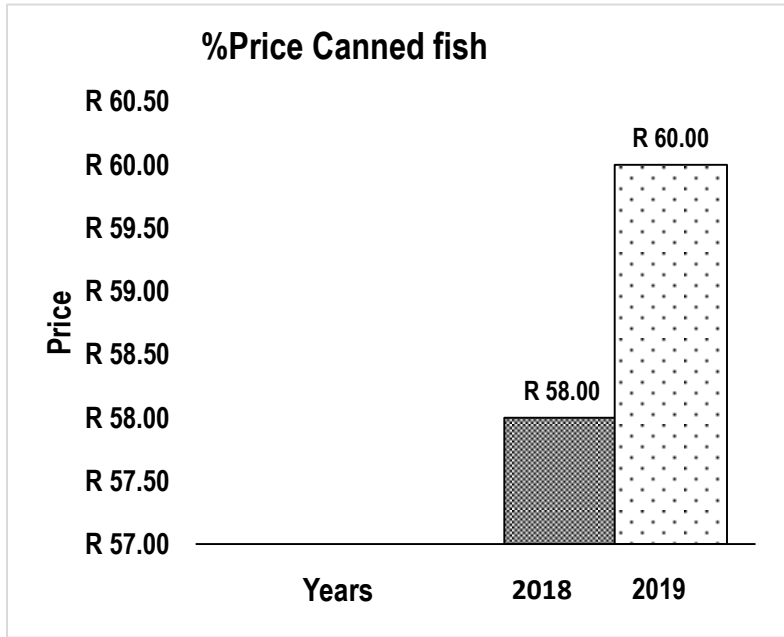
- 5.2.1 Which programme is most popular amongst male students? (2)
- 5.2.2 Calculate the mean number of the female students enrolled per programme. (3)
- 5.2.3 Which programme represents the median of the number of female students enrolled? Show all working. (3)
- 5.2.4 Calculate the range of the male students enrolled per programme. (3)
- 5.2.5 How many students were enrolled at this college? (2)

5.3 The pie chart below shows the percentage increase of the price of bread, milk and vegetables. Explain the error in the pie chart.



(2)

5.4 The graph below shows the change in price of canned fish from 2018 to 2019:



Study the above graphs to answer the questions.

- 5.4.1 What type of graph is represented above? (1)
- 5.4.2 Calculate the percentage increase in the price of canned fish between 2018 and 2019. (3)
- 5.4.3 Give TWO reasons why the above graph is misleading. (4)

[30]

TOTAL: 150

ANSWER SHEET 1**EXAMINATION
NUMBER:**

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QUESTION 3.2

BUDGET FOR 1st QUARTER 2019				
Item	Item No.	Budget (Planned)	Actual (Realised)	Variance (Difference)
INCOME		R	R	R
Landscaping	1	45 000	35 000	- 10 000
Gardening Services	2	60 000	65 523	+ 5 523
Spaza Shop	3	90 000	98 435	(e)
TOTAL INCOME		195 000	(b)	(f)
EXPENSES		R	R	R
Rent	4	9 000	9 000	0
Wages	5	25 000	29 600	- 4 600
Water & Electricity	6	6 500	4 525	+ 1 975
Landline & Cell phone	7	3 600	(c)	+ 650
Vehicle fuel & maintenance	8	12 000	(d)	- 3 623
Stationery & printer	9	2 500	1 550	(g)
Other	10	3 000	325	+ 2 675
TOTAL EXPENSES		61 600	63 573	(h)
SURPLUS/DEFICIT		(a)	135 385	- 1 985

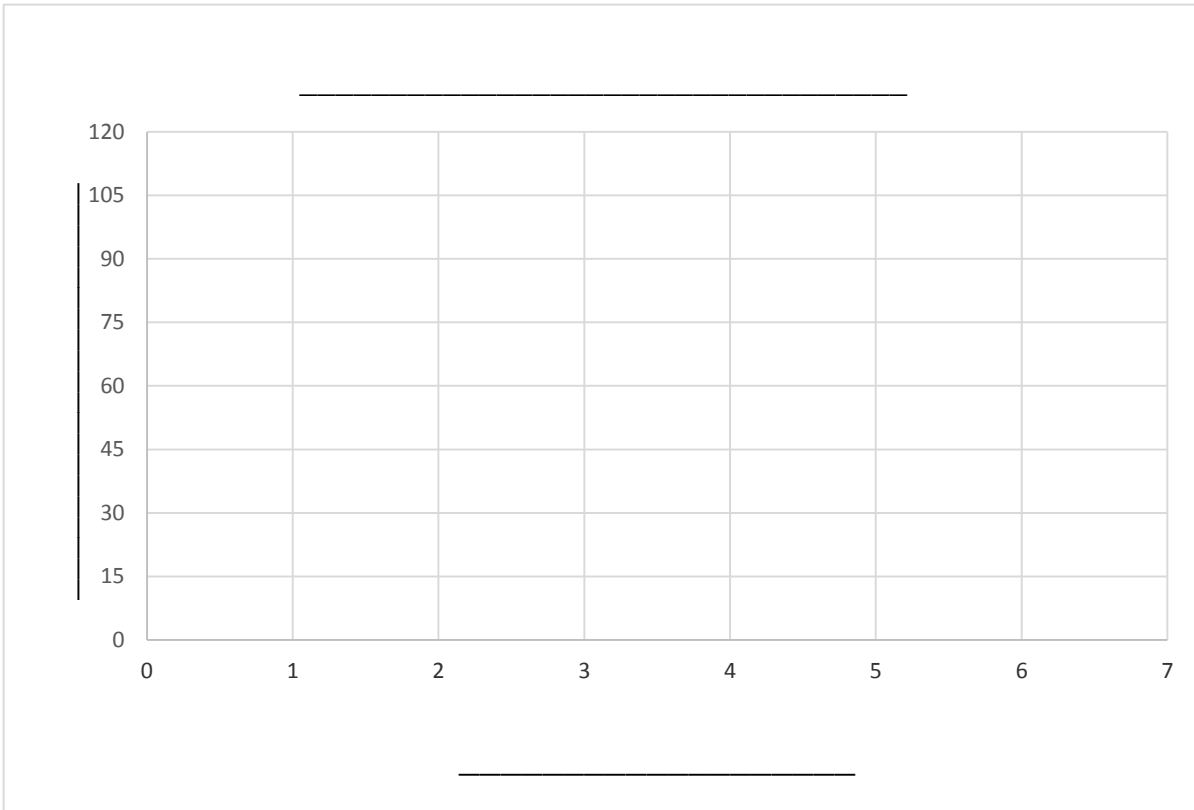
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ANSWER SHEET 2

**EXAMINATION
NUMBER:**

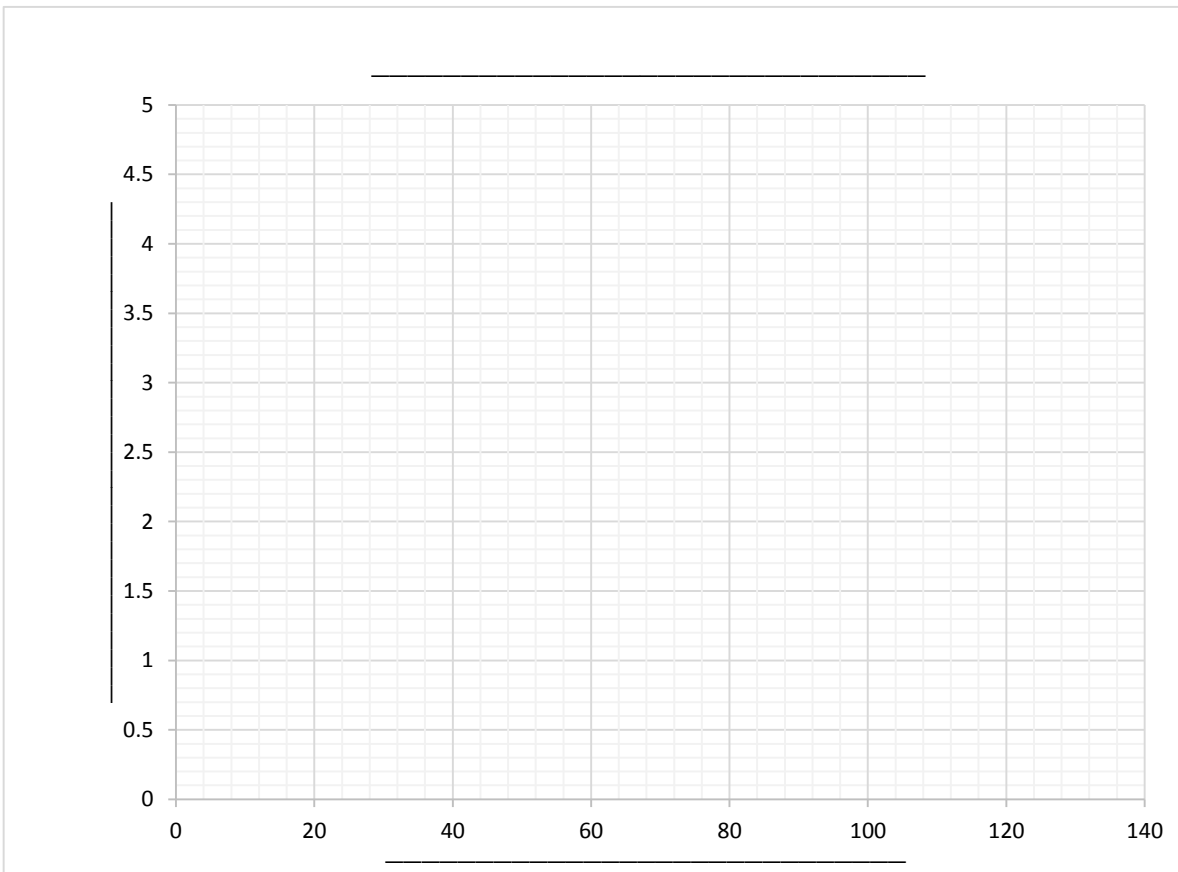
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4.1.7



5

4.1.8



5

ANSWER SHEET 3

**EXAMINATION
NUMBER:**

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5.1.1

FREQUENCY TABLE		
MEDIA	TALLY	FREQUENCY
Facebook		
Twitter		
Instagram		
WhatsApp		
e-Mail		
TOTAL		

6