higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY

(Second paper)

NQF LEVEL 3

(10401023)

11 November 2024 (X-paper)
09:00–12:00

Non-programmable calculators and drawing instruments may be used.

This question paper consists of 8 pages and 2 answer sheets.

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NATIONAL CERTIFICATE (VOCATIONAL)
MATHEMATICAL LITERACY
NQF LEVEL 3
(Second paper)
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. Answer QUESTIONS 1.1.6 and 1.2.3 on ANSWER SHEET 1 and QUESTION 3.2.2 on ANSWER SHEET 2 (both attached). Write your EXAMINATION NUMBER on each ANSWER SHEET, detach them from the question paper and hand them in with the ANSWER BOOK.
5. Round off answers correctly according to the given context. In all other cases, where the context is not specific, round off answers correctly to TWO decimal places.
6. Indicate units of measurement where applicable.
7. Diagrams are not necessarily drawn to scale.
8. Clearly show all calculations.
9. Use only a black or blue pen.
10. Write neatly and legibly.

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QUESTION 1

1.1 A table below shows the weights of several patients recorded by a nurse at the local clinic. Use the information in the table to answer the questions.

76	74	92	78	64	57
87	85	55	69	78	95
66	90	88	62	59	55
79	71	68	78	93	73

1.1.1 Calculate the mean weight from the data. (4)

1.1.2 Determine the median weight. (2)

1.1.3 Calculate the range of the given data. (2)

1.1.4 Determine the modal weight (mode). (1)

1.1.5 With respect to the mean and the median, which measure of central tendency is the best to use for the given scenario? Substantiate your answer. (3)

1.1.6 Complete a frequency distribution table provided in ANSWER SHEET 1 (attached) to organise the data. (7)

1.2 A shoe store manager performed a survey to determine the various type of footwear purchased by male and female clients. The results are shown in the table below.

Type of footwear	Number of shoes purchased	
	Male	Female
Sandals	6	8
Formal shoes	8	7
Sneakers	9	7
Flip-flops	5	9
High heels	2	6
Total		

1.2.1 What type of footwear was mostly purchased? (1)

1.2.2 How many footwear items were sold in the survey? (1)

1.2.3 Use the information provided in the table to draw a double bar graph on ANSWER SHEET 1 (attached) that shows the type of footwear purchased by male vs female. Label the graph accordingly and provide it with a suitable heading. (8)

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1.2.4 What is the probability that a client selected at random will purchase sandals or sneakers? Give the answer as a percentage rounded off to two decimal places. (3)

1.2.5 If a female client was selected at random, what is the probability of selecting the one who purchased high heels? Give the answer as a percentage rounded off to two decimal places. (3)

[35]

QUESTION 2

2.1 Mimi has been promoted to become a deputy manager of a small company. Her annual salary has increased from R456 000 to R750 000 per annum.

2.1.1 One of the deductions from her gross salary is a 1% UIF contribution. Calculate the difference in her UIF monthly deduction after increase. (5)

2.1.2 The total deductions on her old salary were 30% of her gross salary while the total deductions on her new salary has increased to 35% of her gross salary due to promotion.

Determine the percentage increase of her net salary.

Formula:

$$\text{Percentage (\%) Increase} = \frac{\text{New Net Salary - Old Net Salary}}{\text{Old Net Salary}} \times 100\%$$

(8)

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2.2 A table below shows a budget of a small business for selling eggs and live chicken during March 2024.

Formulae: Variance = Actual (R) – Planned Budget (R)

$$\text{Perecentage (\%) Variance} = \frac{\text{Variance (R)}}{\text{Planned Budget (R)}} \times 100\%$$

SMALL BUSINESS BUDGET FOR MARCH 2024				
Item	**Planned Budget (R)**	**Actual (R)**	**Variance (R)**	**Percentage %Variance**
Income: Sales				
Eggs	80000	95000	15000	18,75%
Chicken	60000	55000	**A**	-8,33%
Total Sales	**140000**	**150000**	**10000**	**B**
Expenses				
Wages	**C**	37000	3000	8,82%
Input costs	16000	18000	2000	12,50%
Marketing	19000	**D**	-4000	-21,05%
Other	26000	29000	**E**	11,54%
Total Expenses	**95000**	**99000**	**4000**	**4,21%**
	Profit	**F**		

2.2.1 Use the formulae and information provided to determine the missing values of A to F. (6 × 2) (12)

2.2.2 Write down the formula to calculate profit. (3)

2.2.3 The actual expenses amount on the Input Costs is R18 000 and is VAT inclusive. Calculate the initial amount VAT exclusive if VAT is charged at 15%. (4)

2.2.4 State if the following items had a positive or an adverse (negative) variance on the budget. Give a reason for each response.

a) Eggs (2)

b) Chicken (2)

c) Input Costs (2)

d) Marketing (2)

[40]

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QUESTION 3

3.1 Siyanda's mother sells muffins in town. She buys a dozen of muffins for R50 and sells it for R72. Siyanda's mother pays a monthly rent of R2 500 and fixed monthly rates of R200 for water and R300 for electricity.

3.1.1 Determine Siyanda's mother's total monthly fixed costs. (2)

3.1.2 If a loose muffin is sold for R6,00 each, calculate the income if 2 dozen of loose muffins were sold. (3)

3.1.3 Write an equation (in terms of dozens) that she can use to calculate her:

a) Total monthly cost with stock included. (2)

b) Monthly income. (2)

3.1.4 If Siyanda's mother sold 252 dozen muffins, will she make a profit or a loss? Show all calculations to substantiate the answer. (6)

3.2 The table below shows the cost for two different bus rental options.

	MAQ Bus Hire	**Skip Bus Hire**
Booking deposit	None	2 000
Free kilometres	None	First 350 km
Tariff	R3,50 per km	R1,50

	0	50 km	100 km	**A**	1 000 km	2 000 km
MAQ Bus Hire	0	175	300	1 400	**B**	7 000
Skip Bus Hire	2 000	2 000	2 000	2 075	2 975	4 475

3.2.1 Determine the value of A and B by using the following formulae:

MAQ Bus Hire = 3,50 × distance

Skip Bus Hire = 2 000 + 1,50 × (distance – 350) (6)

3.2.2 Use the given information to sketch graphs for both companies on the same set of axes on ANSWER SHEET 2 (attached). Give the graph a suitable heading and label the axes. (7)

3.2.3 At how many kilometres will the cost be the same? (1)

3.2.4 Which company would you recommend to people going on holiday? Motivate for your choice. (3)

3.2.5 Is the relationship between the distance to be travelled and the amount charged by Skip Bus Hire a direct or indirect relationship? Give a reason for the answer. (3)

[35]

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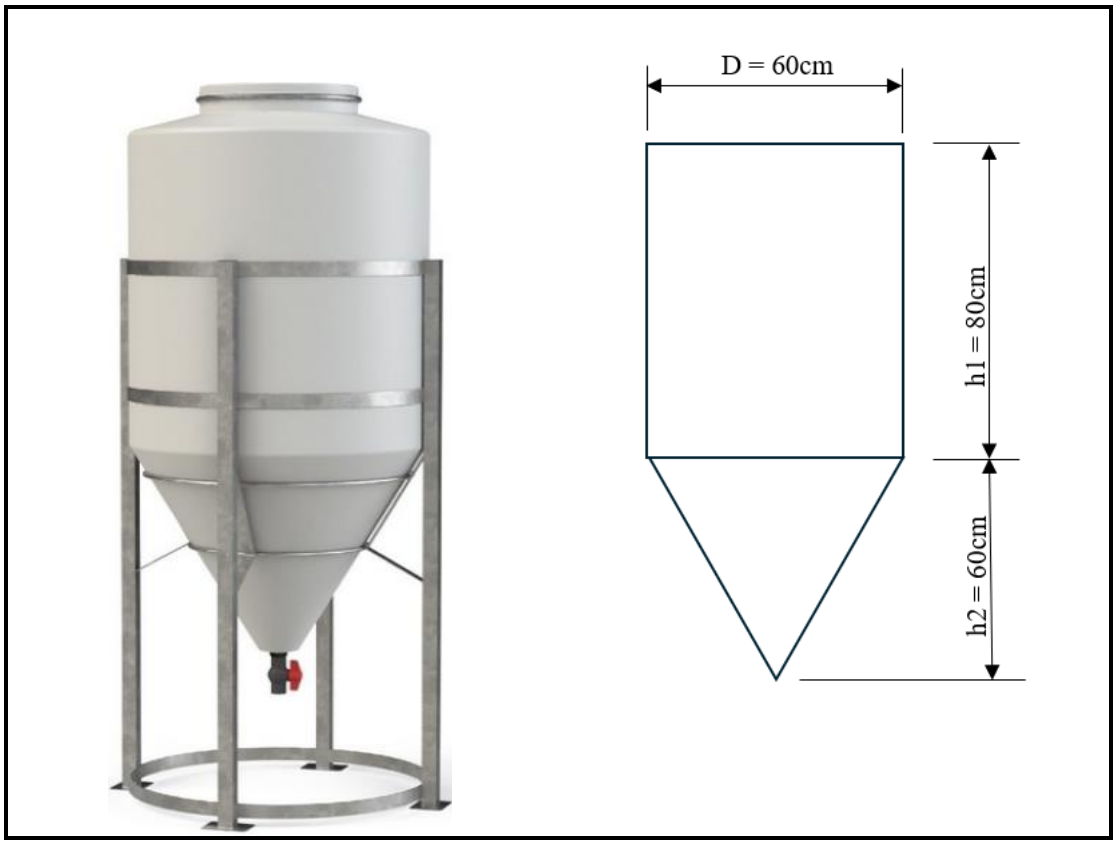
QUESTION 4

4.1 A farmer is in a business of producing yoghurt. An image below shows the milk fermentation tank in a shape of a cylinder and a cone. On the righthand side of the tank you are provided with the effective dimensions of the tank. Use the information provided to answer the questions.



4.1.1 Calculate the capacity (volume) of the tank in litres (ℓ) if 1 m^3 = 1000 ℓ **OR** 1000 cm^3 = 1 ℓ.

Formulae:

$V_{Cone} = \frac{1}{3}\pi r^2 h$ where $\pi = 3,14$

$V_{Cylinder} = \pi r^2 h$ where $\pi = 3,14$ (12)

4.1.2 The farmer is selling yoghurt in bottles of 500 millilitres each as shown on the righthand side. During the filling of these bottles, there is a spillage or loss of 5%.



Determine the number of yoghurt bottles that can be filled by one tank considering spillage or loss of 5% during filling. (8)

4.1.3 Yoghurt bottles are packed in boxes for delivery. Each box can contain 12 bottles. Calculate how many boxes are required to pack all the bottles in QUESTION 4.1.2. (4)

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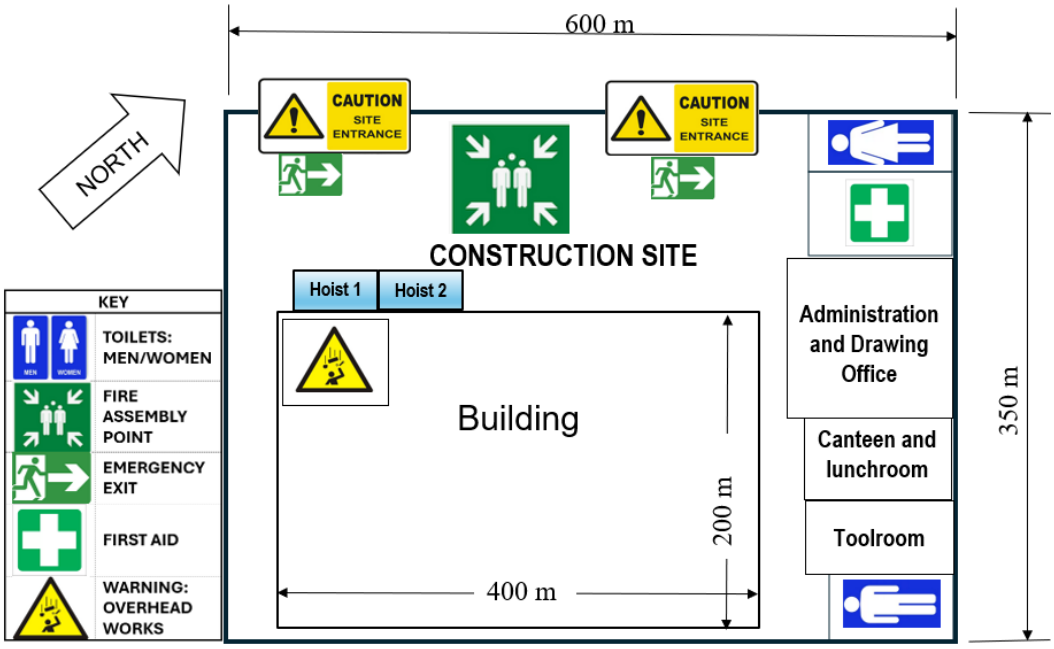
4.2 A diagram given below shows a construction site of a shopping centre been built on a rectangular stand with a length of 600 metres and a breadth of 350 metres. Note that except the building, all offices and other rooms that appear on the diagram are temporary structures until the construction is completed. Use the information provided on the diagram to answer the questions.



4.2.1 What is the compass direction of a Fire Assembly Point as seen from where First Aid is located? (2)

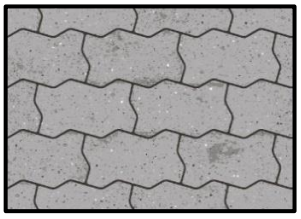
4.2.2 What does the safety/warning sign inside the building mean? (1)

4.2.3 Write down one example of a temporary structure included in the diagram. (1)

4.2.4 Calculate the area of the entire construction site and convert your answer to hectares (ha) if 1ha = 10 000 m^2.

Formula: Area of Construction Site = Length × Breadth (4)

4.2.5 At the completion of the construction of the building, all temporary structures will be removed, and the remaining part of the construction site will become a parking area and will be covered with paving bricks. The total inclusive cost of paving is R160 per m^2.



Formulae: Area of building = Length × Breadth
Parking Area = Construction Site Area – Building Area

Calculate the total cost to cover the parking area with paving bricks. Round your answer to the rearrest million. (8)

[40]

TOTAL: 150

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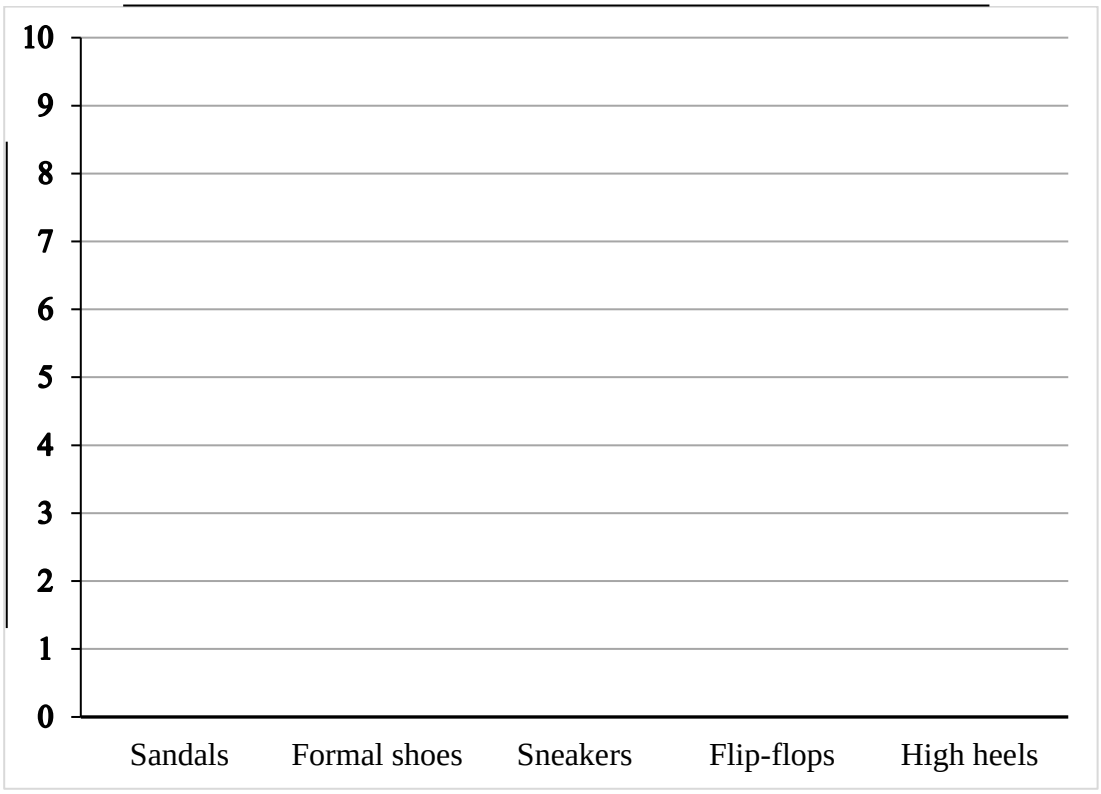
ANSWER SHEET 1 **EXAMINATION NUMBER:**

QUESTION 1

1.1 1.1.7

FREQUENCY	TALLY	TOTAL
51 – 60		
61 – 70		
71 – 80		
81 – 90		
91 – 100		
TOTAL		

1.2 1.2.3



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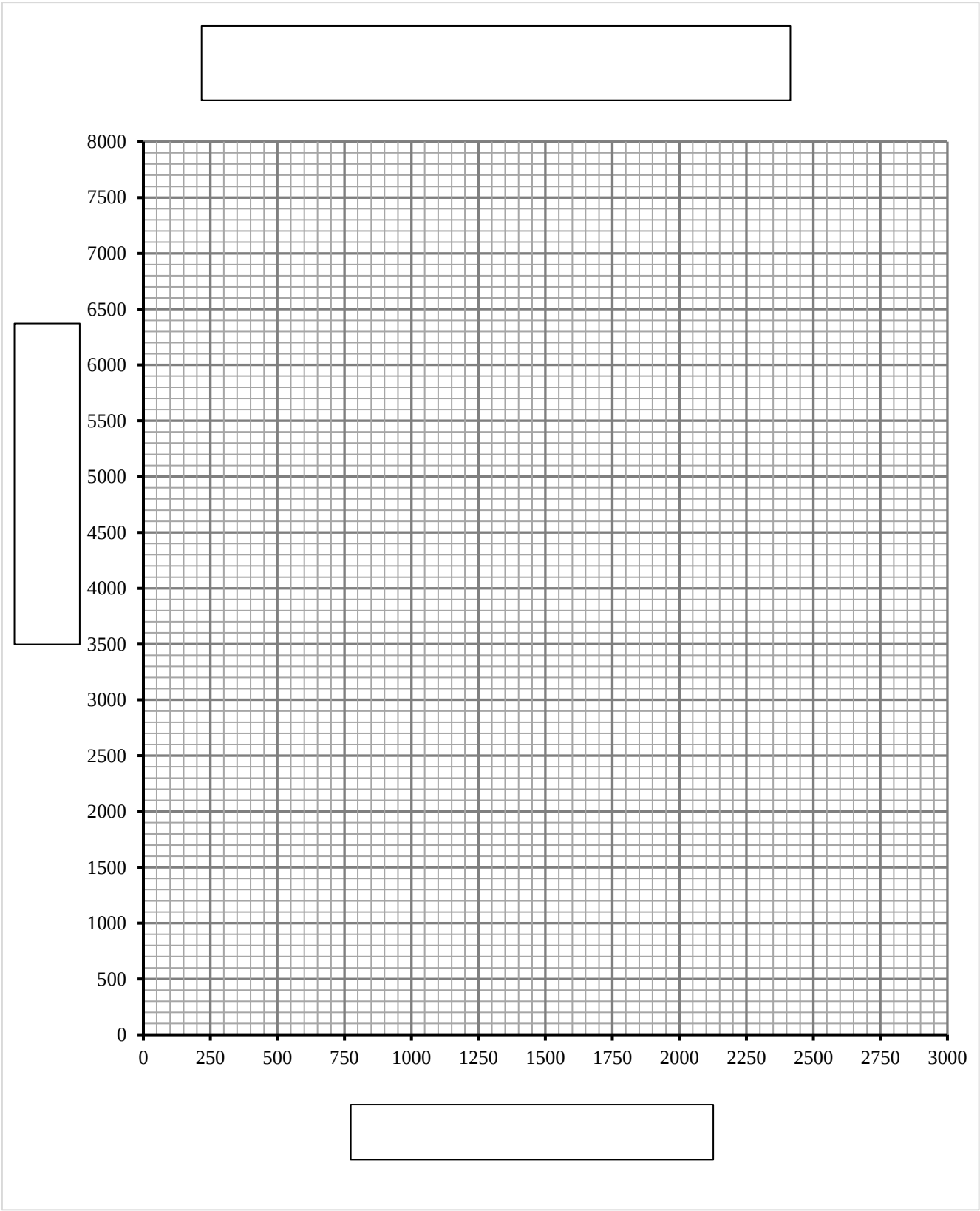
ANSWER SHEET 2 **EXAMINATION NUMBER:**

QUESTION 3

3.2 3.2.2



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