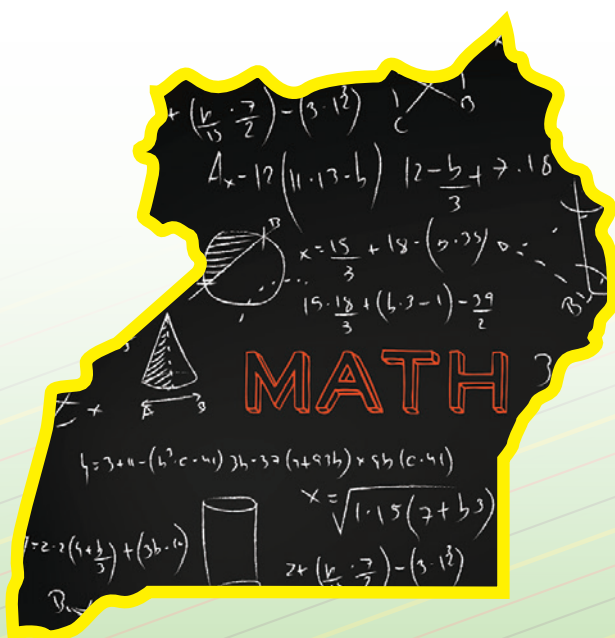


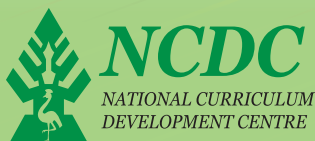


THE REPUBLIC OF UGANDA
Ministry of Education and Sports

ADVANCED SECONDARY CURRICULUM



SUBSIDIARY MATHEMATICS ASSESSMENT GUIDELINES



2026

ADVANCED SECONDARY CURRICULUM

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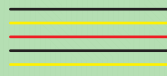
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Contents

1. Introduction	1
1.1 Assessment Objectives	1
1.2 Linkage Between Assessment Objectives, Constructs And Syllabus	2
2. Table Of Constructs.....	3
3. Structure Of The Assessment Paper	22
4. Scoring Rubrics For Subsidiary Mathematics.....	30
5. Performance Level Descriptors.....	70



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NCDC takes responsibility for any shortcomings that might be identified in this publication and welcomes suggestions for effectively addressing the inadequacies. Such comments and suggestions may be communicated to NCDC through P. O Box 7002, Kampala, or Email: admin@ncdc.go.ug or on the Website: www.ncdc.go.ug



Dr Bernadette Nambi Karuhanga

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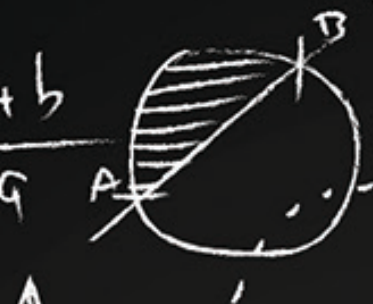
National Curriculum Development Centre

$$x = 19$$

$$2 + \left(\frac{b}{15} \cdot \frac{7}{2}\right) - (3 \cdot 1^2)$$

$$y = 2 - 2(4)$$

$$A_x = 12(11 \cdot 13 - b) \quad 12 - \frac{b}{3} + 7 \cdot 18$$

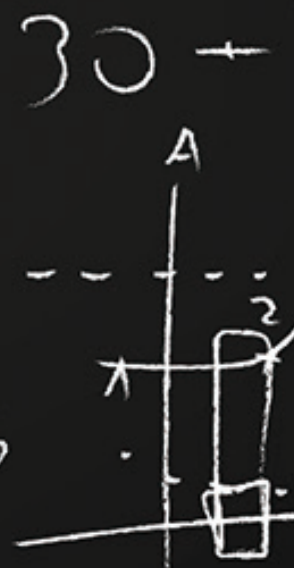


$$x = \frac{15}{3} + 18 - (5 \cdot 35) \Delta$$

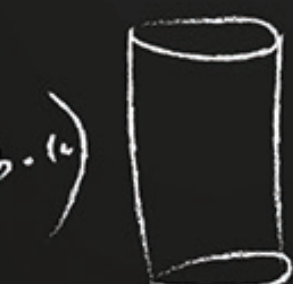
$$15 \cdot \frac{18}{3} + (b \cdot 3 - 1) - \frac{39}{2}$$



MATH



$$b^2 \cdot c - 41) 3b - 37 (7 + 97b) \times 9b (c \cdot 41)$$

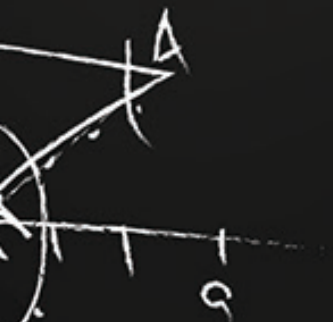


$$x = \sqrt{1 \cdot 15(7 + b^3)} 15$$

$$2 + \left(\frac{b}{15} \cdot \frac{7}{2}\right) - (3 \cdot 1^2)$$

$$\sqrt{15 \cdot 1 \left(b^5 + \frac{11}{3}\right) b a \cdot c}$$

$$b = 15$$



$$4 = 3 + 11 - (b^2 \cdot c - 41) 3b - 37 (7 + 97b)$$

1. Introduction

This assessment guidelines document has been developed as a companion to the Assessment Framework for Advanced Secondary Curriculum and should be read and applied in conjunction with it. The Framework provides the overarching principles, standards, and requirements for assessment across all subjects, while this guideline contextualises those provisions to the specific demands and practices of Subsidiary Mathematics as a subject.

The assessment of Subsidiary Mathematics will be guided by four assessment objectives, drawn from the four assessment constructs. The assessment items will be set at the level of the construct, allowing learners to integrate knowledge, skills and values, drawn from the topics within a construct in order to address a societal challenge or problem. The end of cycle assessment of Subsidiary Mathematics will be administered by the Uganda National Examinations Board (UNEB).

1.1 Assessment Objectives

The end of cycle assessment for Subsidiary Mathematics will be guided by four assessment objectives focusing on the learner's ability to:

A01: Analyse real world situations involving data and uncertainty to support informed decision making.

A02: Model relationships between quantities using algebraic concepts to solve real life problems.

A03: Apply concepts of change and accumulation to solve real world problems.

A04: Analyse spatial relationships to solve real world challenges

1.2 Linkage between Assessment Objectives, Constructs and Syllabus

The following table shows a linkage between the assessment objectives, the constructs and the topics in the syllabus that contribute to the construct.

Table 1

Table showing relationship between assessment objectives, constructs and the topics in the syllabus

Assessment Objective	Construct	Construct Description	Topics in the Syllabus
AO1	Data Analysis and Probability	Analysing and interpreting data to identify trends for informed decision making and predictions in uncertain situation.	1. Matrices 3. Descriptive Statistics 7. Time Series Analysis 8.Scatter Diagrams and Correlations 11. Probability Theory 14. Random variables 15. Probability Distributions
AO2	Algebra	Applying symbolic reasoning and generalisation to solve problems and model relationships in real world situations.	2. Quadratics 4. Numerical Concepts 5. Series 6.Permutations and Combinations
AO3	Calculus	Analysing and modeling of change and accumulation in real-life situations	12. Differentiation 13. Integration 16. Differential Equations
AO4	Geometry	Analysing of spatial relationships to solve real-life problems	9. Vectors 10. Trigonometry

2. Table of Constructs

The table below details the constructs for Subsidiary Mathematics, i.e., the topical competencies that make up the construct, the expected learner abilities and what the assessor should look out for in the learner's work as evidence of achievement of the intended competencies (indicators of mastery).

Construct	Topical Competencies The learner:	Abilities The learner should be able to:	Indicators of Mastery The learner:	Level of Complexity
DATA ANALYSIS AND PROBABILITY Analysing and interpreting of data to identify trends for informed decision making and predictions in	1) applies matrices to represent data for solving real-world problems.	a) represent data from real life situation in form of matrices b) perform matrix operations c) form simultaneous equations in two or three variables using Crammer's rule.	i) accurately identifies variables and organises data into an appropriate matrix format. ii) labels rows and columns clearly to reflect the given context. iii) adds, subtracts and multiplies 2x2 and 3x3 matrices. iv) expresses the system of equations in matrix form. v) calculates determinants of 2x2 and 3x3 matrices.	HIGH

uncertain situation.		d) apply Cramer's rule to solve simultaneous equations in two and three variables.	vi) applies Cramer's rule to solve simultaneous in two and three variables. vii) interprets solutions in the context and justifies decisions made.
	3) analyses statistical measures to effectively interpret data from real life contexts, enabling them to make informed decisions.	a) organise data. b) represent data. c) analyse measures of central tendency/dispersion/relative position. d) interpret measures of central tendency/dispersion/relative position for making informed decisions in real	i) organises data in a frequency table. ii) represents data on histogram and Ogive. iii) estimates mean, mode and median. iv) estimates range, variance and standard deviation. v) analyses quartiles, deciles and percentiles. vi) analyses standard deviation and variance. vii) interprets mean, mode and median.

			viii) interprets standard deviation and variance. ix) interprets quartiles, deciles and percentiles.
7) analyses the effectiveness of moving averages and index numbers on prediction of trends of events and their impact on policy decisions.	life situations.	a) compute odd and even point averages. b) draw and interpret graphs of moving averages. c) evaluate index numbers. d) predict trends of events/quantities.	i) computes odd and even point averages. ii) draws graphs of moving averages. iii) interprets graphs of moving averages. iv) evaluates simple index numbers/relatives, simple aggregate index, simple average/ cost of living index, weighted average/ cost of living, value index, weighted aggregate index. v) predicts trends of events/quantities using moving averages vi) predicts events/ quantities using index numbers

	8) Interpret data from real life scenarios to understand relationships between two variables in various contexts for decision making and prediction.	a) represent relationship between two variables on scatter diagrams with correct scales and labels. b) draw a line of best fit through the mean point to support visual prediction. c) determine correlation coefficients (Spearman's) from given data sets. d) interpret correlation results to predict and make decisions.	i) represents relationship between two variables on scatter diagram. ii) explains the strength and direction of relationships. iii) draws a line of best fit through the mean point. iv) determines correlation coefficient. v) selects appropriate method for given data. vi) relates findings to real-life implications vii) analyses correlation coefficient to predict and make decisions.	
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11) applies the knowledge of probability theory in predictions and decision-making processes	a) generate sample space. b) calculate probabilities. c) use probabilities to make decisions in uncertain situations.	i) generates a sample space using tree diagrams/ permutations and combinations. ii) applies laws of probability (“AND” and “OR” rule). iii) designs contingency table. iv) Estimates probabilities. v) solves conditional probability problems. vi) interprets probability outcomes to make predictions or support decisions.	
14) analyses concepts of random variables to model real-world situations in various contexts for informed decision making.	a) distinguish the random variables. b) compute probabilities. c) sketch graphs. d) model real world situations.	i) identifies discrete random variable. ii) generates probability distribution. iii) applies properties of probability distribution function (p.d.f) of discrete random variables to determine probabilities of events.	

		iv) sketches a graph of a p.d.f. v) determines mean/expectation, mode, median, variance and standard deviation for discrete random variables. vi) identifies continuous random variable. vii) applies properties of continuous random variables to determine probabilities of events. viii) computes probabilities of continuous random variables. ix) determines mean/expectation, variance and standard deviation) by integration. x) applies the concepts of random variables to solve real-world problems.	
	e) determine measures of central tendencies. f) determine measures of dispersion. g) interpret statistical measures for making informed decisions.		

15) interprets binomial and normal distributions for analysis of data patterns and trends in real-life contexts.	a) identify conditions for the binomial distribution and its application to binary outcomes. b) apply the binomial formula to compute probabilities. c) identify the key parameters of normal distribution. d) apply the normal distribution function to solve societal problems.	i) identifies conditions and parameters for the binomial distribution. ii) applies the binomial formula to compute probabilities ($n \leq 20$) of real- life binary outcomes. iii) determines mean, mode and variance of binomial distribution. iv) identifies the key parameters of normal distribution and their significance. v) standardises random variables. vi) determines probabilities. vii) applies the normal distribution function to solve societal problems.
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ALGEBRA Applies symbolic reasoning and generalizing to solve problems and model relationships in real world situations.	2) applies concepts of quadratic equations to solve real-life problems in different contexts	a) examine the relationships between the sum and product of quadratic roots. b) formulate a quadratic equation to represent the relationship in a real-life context c) solve quadratic equations (completing squares and factorisation).	viii) interprets statistical measures for making predictions and solve real-life problems. i) identifies variables and parameters in a real-life situation. ii) states reasonable assumptions and constraints that fit the context. iii) uses relationships between sum and product of roots to form an appropriate quadratic equation. iv) expresses the model in a mathematical form. v) chooses an appropriate method (factorisation/ completing the square/ quadratic formula/ graphical).	HIGH
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		d) model real-life situations using quadratic equations. e) interpret given quadratic equations in real-life contexts. f) analyse quadratic functions for optimisation.	vi) solves the equation accurately, showing all relevant steps. vii) interprets solutions in the context of the problem, rejecting non-feasible values. viii) explains the meaning of the discriminant in relation to the situation. ix) Identifies the vertex of a quadratic function (maximum or minimum point). x) determines the maximum or minimum value and its location using calculus, completing the square, or vertex formula. xi) explains the significance of the optimum value in the given context.	
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			xii) verifies the solution graphically/completing the square/formulae. xiii) discusses how changes in parameters affect the optimum.
4) applies indices and logarithms to solve societal problems involving exponential relationships and scaling in various fields	a)manipulate exponential and logarithmic expressions using the laws of indices and logarithms. b)solve equations involving indices and logarithms, including those reducible to quadratic form. c) switch between exponential and logarithmic forms.	i) simplifies exponential expressions. ii) applies laws of indices. iii) evaluates equations reducing to quadratics. iv) interprets solutions in context like exponential growth, etc. v) illustrates logarithmic notation. vi) demonstrates the relationship between indices and logarithms.	

		c) develop formulae for determining n^{th} term and sum of n terms for A.P and G.P d) apply A.P and G.P to make decisions on investment plans, payment scheme, etc.	v) writes the sum of terms for a given sequence in series form. vi) differentiates between finite and infinite series where applicable. vii) derives or states the correct n^{th} term and sum formulae for both A.P and G. viii) uses the formulae to compute required values. ix) models the situation using A.P or G.P.	
6) applies knowledge of permutations and combinations to solve problems related to	a) use $n!$ to determine number of arrangements. b) evaluate total number of possible arrangements in circles, rows/line.	i) applies factorial notation to calculate arrangements. ii) uses the ${}^n P_r$ notation. iii) applies appropriate arrangement formulae for linear and circular permutations.		

	counting, arranging, and selecting items in different fields.	c) determine number of selections from different sets of items. d) make informed selections of items that maximise efficiency despite restrictions.	iv) distinguishes between cases where arrangements are distinct or equivalent. v) uses the nC_r notation. vi) applies combination principles to calculate selections. vii) identifies and applies appropriate formulas for selections without repetition or with repetition (if applicable). viii) uses case studies to discuss applications of permutations and combinations in real-life.	
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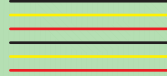
CALCULUS Analysis and modelling of change and accumulation	12) applies differentiation techniques in optimisation and analysing rates of change to interpret their significance in real life.	a) analyse the behaviour of quadratic and cubic functions. b) investigate nature of the turning point /stationary /fixed point. c) determine rates of change. d) apply differentiation concepts to growth, optimisation of resources, velocity, displacement and acceleration.	i) determines the derivatives (first and second) of linear, quadratic and cubic functions. ii) investigates the gradient (slope) of the curve at different points. iii) carries out differentiation of the $\ln(x)$. iv) determines the value of x for which the function is either minimum or maximum. v) determines the maximum and minimum values of function. vi) formulates mathematical function of optimisation. vii) identifies optimal points and explains their real-life implications.	HIGH
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		viii) sketches quadratic curves. ix) explores and justifies why $\frac{dr}{dt} = v(t)$ and $\frac{dv}{dt} = a(t)$. x) solves real-world problems involving optimisation and growth.
13) applies integration techniques to solve problems involving areas, accumulation of quantities and other real-world applications.	a) evaluate definite and indefinite integrals. b) analyse integrals of the form $\int \left(\frac{1}{x}\right) dx = \ln x + C$ c) evaluate the area between a curve and a line, two curves. d) interpret physical quantities such as displacement, velocity, and	i) relates integration and differentiation. ii) evaluates definite and indefinite integrals. iii) analyses Integrals of the form $\int \left(\frac{1}{x}\right) dx = \ln x + C$. iv) produces a clear, scaled diagram. v) sets up the integral with appropriate limits. vi) determines the area between a curve and a line.

			vii) determines the area between two curves. viii) applies integration to determine displacement function = $\int v(t) dt$ over a given time interval. ix) applies integration to determine velocity functions = $\int a(t) dt$. x) solves real-life problems involving accumulation.	
	total change over time.		i) distinguishes variables in diverse contexts. ii) models equations that reflect the situation. iii) applies known conditions to find unique solutions.	
		a) identify dependent and independent variables in a situation (e.g., population and time).		
	16) analyses problems involving rates of change for prediction of alterations in various natural and social			

	phenomena over a period of time.	b) construct a first order differential equation from a given relationship. c) apply technique of separation of variables to integrate differential equations.	iv) carries out integration, interpreting and interrogating mathematical data. v) explains the meaning of the results clearly. vi) makes predictions and communicates findings effectively. vii) interprets the solution of the differential equation in context.	
GEOMETRY ANALYSIS Analysing spatial relationships to solve real-life problems	9) analyses vector concepts and operations to solve mathematical and physical problems in 2D spaces in various fields.	a) present vectors in two dimensions. b) Express vectors in unit vector form. c) perform vector operations	i) presents vectors in two dimensions. ii) expresses vectors in diagrams and notation. iii) writes vectors precisely in $\hat{i}, \hat{j}$ form. iv) carries out vector operations (additions, subtraction and scalar multiplication).	HIGH

		d) determine magnitude and direction of a vector. e) compute dot product /scalar product of two vectors. f) compute angle between two vectors. g) apply vectors in real-life situations.	v) determines magnitude of vectors. vi) determines direction of a vector with angles or bearings. vii) obtains dot product of two vectors. viii) obtains scalar product of two vectors. ix) uses scalar product to determine angles. x) models and solves practical problems.
10) analyses trigonometric concepts to solve real-world problems in various fields	a) analyse both primary and reciprocal trigonometric ratios (sine, cosine, tangent, secant, cosecant, cotangent).	i) determines ratios from given data. ii) derives identities, showing logical investigation and clarity in presentation. iii) simplifies complex trigonometric expressions.	



		b) use Pythagorean theorem to derive Trigonometric fundamental identities. c) Use identities to simplify expressions. d) sketch the trigonometric function ($\sin \theta$, $\cos \theta$ and $\tan \theta$) on the graph to find solutions. e) evaluate trigonometric function reducing to quadratics form. f) apply trigonometry in real-life situation.	iv) sketch the trigonometric function ($\sin \theta$, $\cos \theta$ and $\tan \theta$) on the graph to find solutions. v) produces accurate, scaled graphs. vi) solves equations and interprets results in relevant contexts. vii) solves trigonometric functions reducing to quadratics form. viii) solves practical problems (e.g., height measurement, navigation). ix) justifies choice of the trigonometric identity to solve a societal problem.
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3. Structure of the Assessment Paper

There will be one assessment paper for Subsidiary Mathematics at Advanced Secondary Level. This paper will be tailored for learners who need mathematical skills to enhance their studies in other subjects, emphasising the importance of mathematical computation in everyday life and future careers. It will assess the four constructs (Algebra, Calculus, Geometry, and Data analysis and Probability) focusing on both theoretical understanding and practical application. The paper will contain 6 items (one item from Calculus, one from Geometry, two items from Algebra and two from Data analysis and Probability). Each construct will form a section (Section A: Geometry, Section B: Calculus, Section C: Algebra, and Section D: Data Analysis and Probability). The learner will be required to answer one item from each section. The items in the paper will be scenario based. The duration of the assessment paper will be 3 hours (Each item will take 40 minutes and 20 minutes for the learner to read through and make a choice out of the optional items).

Subsidiary Mathematics

November 2025

Time: 3 hours

UGANDA ADVANCED CERTIFICATE OF EDUCATION

SAMPLE EXAMINATION PAPER

SUBSIDIARY MATHEMATICS

Time: 3 hours

INSTRUCTIONS TO CANDIDATES:

*This paper consists of **four** sections; **A, B, C** and **D**. It has six assessment items.*

Section **A** has **one compulsory** item.

Section **B** has **one compulsory** item

Section **C** has **two** items. Answer one item only.

Section **D** has **two** items. Answer one item only

Answer a total of **four** items.

Any additional item(s) answered will **not** be scored.

All answers **must** be written in the answer booklets/sheets provided.

Graph paper is provided.

Silent non-programmable scientific calculators and mathematical tables with a list of formulae may be used.

SECTION A

ITEM 1

A family in your area has been grappling with a land dispute for years. It hired a surveyor to give them a sketch map of its land boundaries.

The surveyor established a fixed reference point on the land, called Point A (0,0). From this reference, she measured a displacement represented by the vector $\begin{pmatrix} 40 \\ 25 \end{pmatrix}$ metres, which led directly to the first corner Point C_1 .

From C_1 , she measured another displacement vector, $y = \begin{pmatrix} 15 \\ -10 \end{pmatrix}$ metres. This led to the second corner Point C_2 .

She then faced the challenge of positioning the final corner point C_3 . She considered that the land is in the shape of a parallelogram and has only managed to identify the x coordinate of C_3 as 15.

Task:

Assist the surveyor in obtaining the detailed sketch of the land.

SECTION B

ITEM 2

The main market in a certain town council, which serves people daily, is congested, and litter quickly piles up during market hours. Environmental officers have raised concerns that if this waste is not managed properly, it will attract flies and rodents, and could spark outbreaks of cholera and other diseases. The officers have observed that the rate of change of litter accumulation in the market can be modeled by:

$$\frac{dL}{dt} = 6t - 0.5t^2 \text{ (kg/h)}, 0 \leq t \leq 8$$

where: $L(t)$ is the total amount of litter (kg) accumulated in t hours after the market opens. Currently, the market operates for 8 hours daily between 8:00 am - 4:00 pm.

The council's waste truck has been collecting all waste in one trip. It can only carry 60 kg per trip. The council needs to know whether a single trip is still enough or plan for more trips.

Also, the safety committee is concerned about the speed of the truck inside the market. To ensure safety of the people, the waste truck moves along an internal lane, and its displacement from the market gate to the collection bay is modelled by: $S(t) = 67.5t^3 - 39t^2$ (m), where t is hours after the truck enters the gate. It uses $\frac{4}{3}$ hours to reach the bay. The recommended speed is 5m/min.

Task:

Advise the council on:

- whether a single trip is still enough to clear the litter out of the market by the closing time. If not, determine how many trips would be required.
- the maximum speed of the truck as it moves towards the collection bay, that guarantees the safety of the people in the market.

SECTION C**ITEM 3**

A secondary school has poor sanitation facilities and is considering holding a fundraising concert to renovate them as they plan to construct new facilities. The school administration is unsure if the fundraising concert is a tentative viable solution, especially since it requires some initial spending of UGX 5,000,000 on tickets. They plan to sell tickets and make profits using the profit model:

$$P(x) = -x^2 + 10000x - 200000,$$

where x is the number of tickets sold and $P(x)$ is total revenue expected.

A group of old students of the school, intend to construct new sanitation facilities. They started with a contribution of UGX 1,000,000 and increased it by a monthly contribution of UGX 2,000,000 each month for a period of 14 months. They intend to put the full amount raised on a fixed account at an annual compound interest rate of 12% in order to grow their contributions and raise UGX 42,855,000 to fund the construction project.

Tasks:

- a) Advise the school administration as to whether the fundraising concert is a viable solution.
- b) Help the old students to determine the time required to raise the estimated total cost of the construction project.

ITEM 4

A certain district is scheduled to host a regional football tournament involving teams from five districts and there is need to improve the sitting arrangement plus replacing the very old chairs with new ones.

Management intends to widen two main corridors without reducing seating capacity by removing space equal to 3 rows and re-arranging the chairs by adding 2 columns between sections. The total number of chairs must remain 180. Management needs to confirm that the new layout truly widens the corridors while keeping 180 chairs.

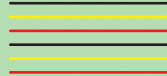
The management plans to replace the old 180 chairs that have been in use for some time. The old chairs were bought at Shs.300,000 each and have been depreciating at a rate of 20% per year.

The procurement officer has confirmed that the current resale value of the chairs is 40% of their original cost. However, the committee is uncertain about the exact period the chairs have been in use.

Task:

Help the management to:

- a) Determine if the new layout widens the corridors while keeping the total number of chairs at 180.
- b) Estimate how long the old chairs might have been in use to better plan for the tournament.



SECTION D

ITEM 5

There will be competitions in different sport activities next term and in order to adequately prepare for the upcoming competitions, the Sports Department at your school plans to introduce a special holiday training programme for learners living within the community. The masses (to the nearest kilogram) of learners who have expressed interest in the program are normally distributed as recorded below:

24	55	63	34	36	56	40	28	43	66
55	58	72	48	49	50	51	61	52	53
53	54	45	41	56	39	57	57	46	58
59	60	51	62	31	64	65	44	68	47

The programme will only commence if the likelihood of learners whose mass exceeds 38 kg is greater than half. The data collected is to be organized in groups of ten from the smallest mass.

The department plans to have three types of weekly training activities for learners which include cardio sessions, strength training sessions and flexibility sessions. Therefore, the department has to design a balanced weekly schedule from the following information gathered from the learners who have participated in a similar programme.

Two cardio sessions, five strength sessions, and two flexibility sessions took a total of 9 hours per week. Nine cardio sessions, four flexibility sessions and three strength sessions, took a total of $18\frac{1}{2}$ hours per week.

Two flexibility sessions, three strength sessions, and seven cardio sessions took a total of 14.5 hours per week.

The following table gives the cost of each session per hour in the years 2024 and 2025.

Session	Cost per hour	Cost per hour	Duration of each
	(2024)	(2025)	session per week
Cardio	UGX.10000	UGX.8500	_____
Strength	UGX. 8000	UGX.6000	_____
Flexibility	UGX. 5000	UGX.7000	_____

The department would like to know the percentage change in cost of the training sessions in order to make an informed communication to the community about the training programme.

Tasks:

Help the department to determine:

- Whether the training programme for 2025 should begin.
- The percentage change in cost of the training sessions per week using 2024 as base year.

ITEM 6

There was a rising absenteeism rate among learners in a certain school linked to lack of lunch. The school administration decided to introduce lunch and must decide whether to keep funding it.

After lunch, a pilot survey of 48 random learners was conducted to rate the meal on a 1 - 5 scale. Of these, 3 rated it 1, 10 rated it 2, 12 rated it 3, 5 rated it 4, and 18 rated it 5.

The programme will be kept only if the variability is at most 1.2.

The administration wants evidence to decide whether to raise the lunch price or seek a subsidy.

To judge affordability, the administration will also use suppliers price data from February 2024 and February 2025. The four core items and weekly use-weights are:

Food stuff	Weight	Price Feb 2024 (UGX)	Price Feb 2025 (UGX)
Maize flour	6	2000	2200
Beans	4	3500	4100
Rice	3	3800	3400
Cooking oil	7	7000	7800

In 2024, each lunch plate was valued for UGX 3,500.

Task:

Help the school administration to:

- Evaluate whether it should keep funding the lunch.
- Decide whether they should rise the price of each lunch plate.

END

4. Scoring Rubrics for Subsidiary Mathematics

SAMPLE SCORING RUBRIC

ITEM 1

Basis of evaluation	Score 4	Score 3	Score 2	Score 1
1) Interpretation of task/ scenario (a) Comprehension of the task in respect to the scenario. a) Analysis of all the 3 vectors b) Label vertices of the plot c) Analysis of the sketch of land d) Analysis of column vectors	Demonstrates comprehensive understanding of the task/ scenario by identifying accurately all the important aspects of the task; ii) Analysis of all the 3 vectors iii) Label vertices of the plot iv) Analysis of the sketch of land v) Analysis of column vectors	Demonstrates good understanding of the task/ scenario by identifying accurately three of the important aspects of the task.	Demonstrates basic understanding of the task, by identifying accurately two important aspects of the task.	Demonstrates limited understanding of the task, by accurately identifying one of the important aspects of the task.

2. Generates and presents; a) Generates ideas that address the task a) Analysis of all the 3 vectors b) Label vertices of the plot c) Analysis of the sketch of land d) Analysis of column vectors	Demonstrates a comprehensive understanding of the task, with all relevant ideas developed accurately. i) Analysis of all the 3 vectors ii) Label vertices of the plot iii) Analysis of the sketch of land iv) Analysis of column vectors	Generates 3 relevant, accurate, and well-developed ideas that address the task effectively.	Generates 2 relevant, accurate, and well-developed ideas that address the task effectively.	Generates 1 relevant, accurate, and well-developed idea that addresses the task effectively.
a) Making connections within and between ideas and scenario	Shows strong and logical connections between ideas and scenario; demonstrates synthesis and depth	Establishes logical connections among 5-6 ideas and relates them appropriately to the scenario.	Addresses the task with 3-4 generally relevant ideas in the scenario to task effectively.	Attempts to address the task with 1 - 2 ideas in the scenario.

i) Analysis of land shape is a parallelogram $AC_1C_2C_3$ ii) Use of parallelogram properties in manipulation iii) Displacement from A to C₁ is represented by vector $AC_1^{\rightarrow}$ iv) Displacement from C₁ to C₂ is represented by vector $C_1C_2^{\rightarrow}$ v) Magnitude of C_3C_2 vi) Quadratic equation	of understanding all ideas in the scenario to task effectively. i) Analysis of land shape is a parallelogram $AC_1C_2C_3$ ii) Use of parallelogram properties in manipulation iii) Displacement from A to C₁ is represented by vector $AC_1^{\rightarrow}$ iv) Displacement from C₁ to C₂ is represented by vector $C_1C_2^{\rightarrow}$		
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vii) Use the vector property to manipulate vector C_3	v) Magnitude of C_3C_2 vi) Quadratic equation vii) Use the vector property to manipulate vector C_3	1- 2 ideas presented coherently with logical sequencing and clear transitions.
c)Presents ideas coherently a) Analysis of all the 3 vectors b) Label vertices of the plot c) Analysis of the sketch of land d) Analysis of column vectors	12 ideas are presented in a clear, logical, and fluent manner; transitions are smooth and enhance meaning; i) Analysis of all the 3 vectors ii) Label vertices of the plot iii) Analysis of the sketch of land	3-5 ideas are presented coherently with logical sequencing and clear transitions.
	6-9 ideas are presented coherently with logical sequencing and clear transitions.	

e) Analysis of land shape is a parallelogram $AC_1C_2C_3$	iv) Analysis of column vectors v) Analysis of land shape is a parallelogram $AC_1C_2C_3$		
f) Use of parallelogram properties in manipulation g) Displacement from A to C₁ is represented by vector $AC_1\vec{}$	vi) Use of parallelogram properties in manipulation vii) Displacement from A to C₁ is represented by vector $AC_1\vec{}$		
h) Displacement from C₁ to C₂ is represented by vector $C_1C_2\vec{}$	viii) Displacement from C₁ to C₂ is represented by vector $C_1C_2\vec{}$		
i) Magnitude of C_3C_2	ix) Magnitude of C_3C_2		
j) Quadratic equation	x) Quadratic equation		

k) Use the vector property to manipulate vector C_3 l) Conclusion of the vertices of the plot with justification of the sketch diagram	xi) Use the vector property to manipulate vector C_3 xii) Conclusion of the vertices of the plot with justification of the sketch diagram	Forms one conclusion that is clear, logical, and supported by relevant evidence; shows sound understanding and some evaluation though shallow; i) Nearly complete with small gaps in explanation or labeling.	Forms two conclusion that is generally relevant and based on knowledge; reasoning is adequate, but lacks depth or justification. i) Basic idea shown but lacks clarity or detail.	Forms one conclusion that shows limited use of knowledge; reasoning is weak with minimal evidence or clarity i) Weak or partly wrong conclusion and rough sketch.
3. Making Informed Judgement a) Conclusion of the vertices of the plot with justification of the sketch diagram	Forms a conclusion that is highly informed, insightful, and well-reasoned; based on comprehensive understanding and application of knowledge. i) Conclusion of the vertices of the plot with justification of the sketch diagram			

ITEM 2

Basis of evaluation	Score 4	Score 3	Score 2	Score 1
1) Interpretation of task/ scenario (a) Comprehension of the task in respect to the scenario. i) Integration of the function ii) Substitution of initial conditions iii) Substitution of $t = 8$ hours iv) Derivative of displacement ($v(t)$) v) Derivative of velocity ($a(t)$)	Demonstrates comprehensive understanding of the task/ scenario by identifying accurately all the important aspects of the task; i) Integration of the function ii) Substitution of initial conditions iii) Substitution of $t = 8$ hours iv) Derivative of displacement ($v(t)$) v) Derivative of velocity ($a(t)$)	Demonstrates good understanding of the task/ scenario by identifying accurately four of the important aspects of the task.	Demonstrates understanding of the task, by identifying accurately important aspects of the task.	Demonstrates limited understanding of the task, by accurately identifying one of the important aspects of the task.

2) Generates and presents; a) Generates ideas that address the task i) Integration of the function ii) Substitution of initial conditions iii) Substitution of $t = 8$ hours iv) Derivative of displacement $(v(t))$ v) Derivative of velocity $(a(t))$	Demonstrates a comprehensive understanding of the task, with all relevant ideas, developed accurately. i) Integration of the function ii) Substitution of initial conditions iii) Substitution of $t = 8$ hours iv) Derivative of displacement $(v(t))$ v) Derivative of velocity $(a(t))$	Generates 3 relevant, accurate, and well-developed ideas that address the task effectively.	Generates 2 relevant, accurate, and well-developed ideas that address the task effectively.	Generates 1 relevant, accurate, and well-developed idea that address the task effectively.
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b) <i>Makes connections within and between ideas and scenario</i> i) Value of the constant C ii) Unique solution after 8 hours in kilograms iii) Value of number of trips iv) Value of time the truck reaches the bay v) Values of maximum speed to ensure safety in the market	Shows strong and logical connections between ideas and scenario; demonstrates synthesis and depth of understanding all ideas in the scenario to task effectively. i) Value of the constant C ii) Unique solution in kilogram after 8 hours. iii) Value of number of trips iv) Value of time the truck reaches the bay	Establishes logical connections among 3 ideas and relates them appropriately to the scenario.	Addresses the task with 2 generally relevant ideas in the scenario to task effectively.	Attempts to address the task with 1 idea in the scenario.
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	v) Values of maximum speed to ensure safety in the market			
c) Presents ideas coherently	14-17 ideas are presented in a clear , logical , and fluent manner; transitions are smooth and enhance meaning;	9-13 ideas are presented coherently with logical sequencing and clear transitions .	4-8 ideas are presented coherently with logical sequencing and clear transitions .	1-3 ideas are presented coherently with logical sequencing and clear transitions .
i) Integration of the function				
ii) Substitution of initial conditions				
iii) Substitution of $t = 8$ hours	i) Integration of the function			
iv) Derivative of displacement ($v(t)$)	ii) Substitution of initial conditions			
v) Derivative of velocity ($a(t)$)	iii) Substitution of $t = 8$ hours			
	iv) Derivative of displacement ($v(t)$)			
	v) Derivative of velocity ($a(t)$)			

vi) Integration of the function	v) Derivative of velocity ($a(t)$)	
vii) Substitution of initial conditions	vi) Integration of the function	
viii) Substitution of $t = 8$ hours	vii) Substitution of initial conditions	
ix) Derivative of displacement ($v(t)$)	viii) Substitution of $t = 8$ hours	
x) Derivative of velocity ($a(t)$)	ix) Derivative of displacement ($v(t)$)	
xi) Make decision on whether a single trip is enough with justification from the values of number of trips	x) Derivative of velocity ($a(t)$)	
	xi) Make decision on whether a single trip is enough with justification from the values of number of trips	

3) Making informed judgement a) Make decision on whether a single trip is enough with justification from the values of number of trips b) Conclusion on maximum safety of people in the market.	Forms two conclusions that are highly informed, insightful, and well-reasoned; based on comprehensive understanding and application of knowledge. i) Makes decision on whether a single trip is enough with justification from the values of number of trips ii) Conclusion on maximum safety of people in the market.	Forms one conclusion that is clear, logical, and supported by relevant evidence; shows sound understanding and some evaluation though shallow; i) Makes decision on whether a single trip is enough with justification from the values of number of trips iii) Conclusion on maximum safety of people in the market.	Forms two conclusions that is generally relevant and based on knowledge; reasoning is adequate, but lacks depth or justification. i) Makes decision on whether a single trip is enough with justification from the values of number of trips ii) Conclusion on maximum safety of people in the market.	Forms one conclusion that shows limited use of knowledge; reasoning is weak with minimal evidence or clarity i) Makes decision on whether a single trip is enough with justification from the values of number of trips ii) Conclusion on maximum safety of people in the market.
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ITEM 3

Basis of evaluation	Score 4	Score 3	Score 2	Score 1
1) Interpretation of task/ scenario <i>Comprehension of the task in respect to the scenario.</i> a) Defines variables of a, d, n, amount principle, rate and time. b) Formation of quadratic equation for profit function c) Formula for sum for A.P	Demonstrates comprehensive understanding of the task/ scenario by identifying accurately all the important aspects of the task; i) Defines variables of a, d, n, amount principle, rate and time. ii) Formation of quadratic equation for profit function iii) Formula for sum for A.P	Demonstrates good understanding of the task/ scenario by identifying accurately three of the important aspects of the task.	Demonstrates basic understanding of the task, by identifying accurately two important aspects of the task.	Demonstrates limited understanding of the task, by accurately identifying one of the important aspects of the task.

d) Formula compound interest	iv) Formula compound interest	Generates three relevant, accurate, and well-developed ideas that address the task effectively.	Generates two relevant, accurate, and well-developed ideas that address the task effectively.	Generates one relevant, accurate, and well-developed idea that address the task effectively.
2) Generates and presents; a) <i>Generates ideas that address the task</i> i) Substitution in the profit function ii) Solving the quadratic solution iii) Substitution in the compound interest iv) Introduction of log notation	Demonstrates a comprehensive understanding of the task, with all relevant ideas, developed accurately. i) Substitution in the profit function ii) Solving the quadratic solution iii) Substitution in the compound interest iv) Introduction of log notation			

b) <i>Makes connections within and between ideas and scenario</i>	Shows strong and logical connections between ideas and scenario; demonstrates synthesis and depth of understanding all ideas in the scenario to task effectively.	Establishes logical connections among three ideas and relates them appropriately to the scenario.	Addresses the task with two generally relevant ideas in the scenario to task effectively.	Attempts to address the task with one idea in the scenario.
i) Value of number tickets to sell				
ii) Value of maximum profit.				
iii) Value of sum of the fourteenth term.				
iv) Value of time in years.				

c) <i>Presents ideas coherently</i> i) Defines variables of a, d, n, amount, principle, rate and time. ii) Formation of quadratic equation for profit function iii) Formula for sum for A.P iv) Formula compound interest v) Substitution in the profit function vi) Solving the quadratic solution	12-14 ideas are presented in a clear, logical, and fluent manner; transitions are smooth and enhance meaning; i) Defines variables of a, d, n, amount, principle, rate and time. ii) Formation of quadratic equation for profit function iii) Formula for sum for A.P iv) Formula compound interest v) Substitution in the profit function	9-11 ideas are presented coherent with logical sequencing and clear transitions.	4-8 ideas are presented coherent with logical sequencing and clear transitions.	1-3 ideas coherent with logical sequencing and clear transitions;
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vii) Substitution in the compound interest viii) Introduction of log notation ix) Value of number tickets to sell x) Value of maximum profit xi) Value of sum of the fourteenth term xii) Value of time in years xiii) Conclusion about the maximum profit basing on the number of cards sold. xiv)			
vi) Solving the quadratic solution vii) Substitution in the compound interest viii) Introduction of log notation ix) Value of number tickets to sell x) Value of maximum profit xi) Value of sum of the fourteenth term xii) Value of time in years xiii) Conclusion about the maximum profit basing on the number of cards sold.			

xv) Conclusion about the time to achieve target amount for construct to start using approximated value of time.	xiv) Conclusion about the time to achieve target amount for construct to start using approximated value of time.	Forms one conclusion that is clear, logical, and supported by relevant evidence; shows sound understanding and some evaluation though shallow; i) Conclusion about the maximum profit basing on the	Forms two conclusions that are highly informed, insightful, and well-reasoned; based on comprehensive understanding and application of knowledge. i) Conclusion about the maximum profit basing on the	Forms one conclusion that shows limited use of knowledge; reasoning is weak with minimal evidence or clarity i) Conclusion about the maximum profit basing on the number of cards sold.	Forms two conclusions that are generally relevant and based on knowledge; reasoning is adequate, but lacks depth or justification i) Conclusion about the maximum profit basing on the number of cards sold.
3) Making informed judgement a) Conclusion about the maximum profit basing on the number of cards sold. b) Conclusion about the time to achieve target amount for construction to start using					

approximated value of time.	number of cards sold. ii) Conclusion about the time to achieve the target amount for construction to start, using approximated value of time.	number of cards sold. ii) Conclusion about the time to be taken to achieve target amount for construction to start, using approximated value of time.	ii) Conclusion about the time to achieve target amount for construct to start using approximated value of time.
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ITEM 4

Basis of evaluation	Score 4	Score 3	Score 2	Score 1
1) Interpretation of task/ scenario a) <i>Comprehension of the task in respect to the scenario.</i> i) Defines variable of rows, columns, depreciation rate, original cost, correct values and time in years ii) Formation of original equation of rows and columns iii) Formation of new equation of	Demonstrates comprehensive understanding of the task/ scenario by identifying accurately all the important aspects of the task; i) Defines variable of rows, columns, depreciation rate, original cost, correct values and time in years ii) Formation of original equation	Demonstrates good understanding of the task/ scenario by identifying accurately four of the important aspects of the task.	Demonstrates basic understanding of the task, by identifying accurately 2-3 important aspects of the task.	Demonstrates limited understanding of the task, by accurately identifying one of the important aspects of the task.

rows and columns iv) Formula for depreciation of quadratic equations v) Formation of quadratic equations	of rows and columns iii) Formation of new equation of rows and columns iv) Formula for depreciation v) Formation of quadratic equations			
2) Generates and presents; a) <i>Generates ideas that address the task</i> i) Making a subject of either rows or columns.	Demonstrates a comprehensive understanding of the task, with all relevant ideas developed accurately. i) Making a subject of either rows or columns	Generates 3 relevant, accurate, and well-developed ideas that address the task effectively.	Generates 2 relevant, accurate, and well-developed ideas that address the task effectively.	Generates 1 relevant, accurate, and well-developed idea that addresses the task effectively.

ii) Substitutions in quadratic equation. iii) Substitutions in depreciation formula. iv) Introduction of log notation.	ii) Substitutions in quadratic equation iii) Substitutions in depreciation formula iv) Introduction of log notation	Establishes logical connections among 3 ideas and relates them appropriately to the scenario.	Addresses the task with 2 generally relevant ideas in the scenario to task effectively.	Attempts to address the task with 1 idea in the scenario
b) Makes <i>connections</i> within and between ideas and scenario i) Solution of quadratic equations ii) Values of rows iii) Values of columns iv) Value of time in years	Shows strong and logical connections between ideas and scenario; demonstrates synthesis and depth of understanding all ideas in the scenario to task effectively. i) Solution of quadratic equations ii) Values of rows			

	iii) Values of iv) columns v) Value of time in years			
c) <i>Presents ideas coherently</i> i) Defines variable of rows, columns, depreciation rate, original cost, correct values and time in years. ii) Formation of original equation of rows and columns. iii) Formation of new equation of rows and columns. iv) Formula for depreciation	11-13 ideas are presented in a clear, logical, and fluent manner; transitions are smooth and enhance meaning; <i>coherently</i> i) Defines variable of rows, columns, depreciation rate, original cost, correct values and time in years ii) Formation of original equation of rows and columns	7-10 ideas are presented coherently with logical sequencing and clear transitions.	3-6 ideas are presented coherently with logical sequencing and clear transitions.	1-2 ideas are presented coherently with logical sequencing and clear transitions.

v) Formation of quadratic equations	iii) Formation of new equation of rows and columns	
vi) Making a subject of either rows or columns	iv) Formula for depreciation	
vii) Substitutions in quadratic equation	v) Formation of quadratic equations	
viii) Substitutions in depreciation formula	vi) Making a subject of either rows or columns	
ix) Introduction of log notation	vii) Substitutions in quadratic equation	
x) Solution of quadratic equations	viii) Substitutions in depreciation formula	
xi) Values of rows	ix) Introduction of log notation	
xii) Values of columns	x) Solution of quadratic equations	
xiii) Value of time in years		

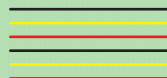
xiv) Conclusion on renovation plan with justification of the new seating arrangement keeps total capacity of 180.	xi) Values of rows xii) Values of columns xiii) Value of time in years			
xv) Conclusion on the time the chairs have been in use with justification of the current resale values.				
3. Making informed judgement	Forms two conclusions that are	Forms one conclusion that is	Forms two conclusion that is	Forms one conclusion that

a) Conclusion on renovation plan with justification of the new seating arrangement keeps total capacity of 180. b) Conclusion on the time the chairs have been in use with justification of the current resale values.	highly informed, insightful, and well-reasoned; based on comprehensive understanding and application of knowledge. i) Conclusion on renovation plan with justification of the new seating arrangement, keeps total capacity of 180. ii) Conclusion on the time in year the chairs have been in use with justification of the current resale values.	clear, logical, and supported by relevant evidence; shows sound understanding and some evaluation though shallow; i) Conclusion on renovation plan with justification of the new seating arrangement, keeps total capacity of 180. ii) Conclusion on the time in year the chairs have been in use with justification of the current resale values.	generally relevant and based on knowledge; reasoning is adequate but lacks depth or justification. i) Conclusion on renovation plan with justification of the new seating arrangement keeps total capacity of 180. ii) Conclusion on the time in year the chairs have been in use with justification of the current resale values.	shows limited use of knowledge; reasoning is weak with minimal evidence or clarity i) Conclusion on renovation plan with justification of the new seating arrangement, keeps total capacity of 180. ii) Conclusion on the time in year the chairs have been in use with justification of the current resale values.
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ITEM 5

Basis of evaluation	Score 4	Score 3	Score 2	Score 1
1) Interpretation of task/ scenario <i>Comprehension of the task in respect to the scenario.</i> i) Writes title ii) Labels columns iii) Generates classes iv) Generates frequency v) Generates $P(X \geq 38)$ vii) Formulates 3 linear systems of equations of training sessions	Demonstrates comprehensive understanding of the task/ scenario by identifying accurately all the important aspects of the task; i) Writes title ii) Labels columns iii) Generates classes iv) Generates frequency v) Generates $P(X \geq 38)$ vii) Formulates 3 linear systems of equations of training sessions	Demonstrates good understanding of the task/ scenario by identifying accurately 5 of the important aspects of the task.	Demonstrates basic understanding of the task, by identifying accurately important aspects of the task;	Demonstrates limited understanding of the task, by accurately identifying 1-2 of the important aspects of the task.

Basis of evaluation	Score 4	Score 3	Score 2	Score 1
2) Generates and presents; a) <i>Generates ideas that address the task</i> i) fx ii) fx^2 iii) Mean formula iv) Standard derivation	Demonstrates a comprehensive understanding of the task, with all relevant ideas, developed accurately. i) fx ii) fx^2 iii) Mean formula iv) Standard derivation	Generates 3-4 relevant, accurate, and well-developed ideas that address the task effectively.	Generates 2 relevant, accurate, and well-developed ideas that address the task effectively.	Generates 1 relevant, accurate, and well-developed idea that addresses the task effectively.
i) <i>Makes connections within and between ideas and the scenario</i> ii) $\sum f$ iii) $\sum fx$ iv) $\sum fx^2$	Shows strong and logical connections between ideas and scenario; demonstrates synthesis and depth of understanding all ideas in the scenario to task effectively.	Establishes logical connections among 5-7 ideas and relates them appropriately to the scenario.	Addresses the task with 3-4 generally relevant ideas in the scenario to task effectively.	Attempts to address the task with 1-2 ideas in the scenario

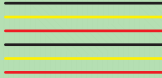


Basis of evaluation	Score 4	Score 3	Score 2	Score 1
v) Mean value vi) Standard derivation value vii) Standardisation viii) Value from the normal distribution table ix) Graph x) Probability Value xi) Values of each session xii) Values of weekly cost for each year Percentage change	i) $\sum f$ ii) $\sum fx$ iii) $\sum fx^2$ iv) Mean value v) Standard derivation value vi) Standardisation vii) Value from the normal distribution table viii) Graph ix) Probability Value x) Values of each session xi) Values of weekly cost for each year xii) Percentage change			

Basis of evaluation	Score 4	Score 3	Score 2	Score 1
c)Presents ideas coherently i) Writes title ii) Labels columns iii) Generates classes iv) Generates frequency v) Generates $P(X \geq 38)$ vii) Formulates 3 linear systems of equations of training sessions viii) $\sum f$ ix) $\sum \mathbf{fx}$ x) $\sum \mathbf{fx}^2$ xi) Mean value xii) Standard derivation value	10-12 ideas are presented in a clear, logical, and fluent manner; transitions are smooth and enhance meaning; i) Writes title ii) Labels columns iii) Generates classes iv) Generates frequency v) Generates $P(X \geq 38)$ vi) Formulates 3 linear systems of equations of training sessions viii) $\sum f$ ix) $\sum \mathbf{fx}$ x) $\sum \mathbf{fx}^2$	7-9 ideas are presented coherent with logical sequencing and clear transitions .	4-6 ideas are presented coherent with logical sequencing and clear transitions .	1-3 ideas coherent with logical sequencing and clear transitions .

Basis of evaluation	Score 4	Score 3	Score 2	Score 1
xiii) Standardisation xiv) Value from the normal distribution table xv) Graph xvi) Probability value xvii) Values of each session xviii) Values of weekly cost for each year xix) Percentage change	xi) Mean value xii) Standard derivation value xiii) Standardisation xiv) Value from the normal distribution table xv) Graph xvi) Probability Value vii) Values of each session viii) Values of weekly cost for each year ix) Percentage change			
3. Making informed judgement i) Decides whether training programme should	i) Forms two conclusions that are highly informed, insightful, and well-reasoned; based on comprehensive	i) Forms one conclusion that is clear, logical, and supported by relevant evidence; shows	i) Forms two conclusions that are generally relevant and based on knowledge;	i) Forms one conclusion that shows limited use of knowledge; reasoning is

Basis of evaluation	Score 4	Score 3	Score 2	Score 1
begin or not, using results ii) Makes communication to the community about total weekly cost of training sessions for 2025	understanding and application of knowledge. ii) Accurately interprets and analyses all results, applies clear reasoning, and makes a well-justified decision on whether the training should begin, supported by valid evidence. iii) Communicates the total weekly cost for 2025 clearly, accurately, and confidently using correct data and summarises the	sound understanding and some evaluation though less deep; ii) Analyses most results correctly, makes a logical decision about the training programme with minor gaps in justification or evidence. iii) Communicates the total weekly cost for 2025 clearly with minor errors and	reasoning is adequate, but lacks depth or justification. ii) Analyses most results correctly, makes a logical decision about the training programme with minor gaps in justification or evidence. iii) Provides general communication of weekly costs for 2025 with some inaccuracies and a summary that	weak with minimal evidence or clarity ii) Demonstrates minimal analysis of results, gives a decision that is unclear or weakly supported by evidence.



Basis of evaluation	Score 4	Score 3	Score 2	Score 1
	information concisely and effectively for community understanding.	provides a reasonable summary understandable to the community.	lacks clarity or completeness. iv) Provides incomplete or unclear communication of costs and summary, showing limited understanding of community needs	

ITEM 6

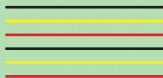
Basis of evaluation	Score 4	Score 3	Score 2	Score 1
1) Interpretation of task/ scenario Comprehension of the task in respect to the scenario. a) Writes titles b) Labels columns c) X d) P(X=x)	Demonstrates comprehensive understanding of the task/ scenario by identifying accurately all the important aspects of the task; i) Writes titles ii) Labels columns iii) X iv) $P(X=x)$	Demonstrates good understanding of the task/ scenario by identifying accurately three of the important aspects of the task.	Demonstrates basic understanding of the task, by identifying accurately two important aspects of the task.	Demonstrates limited understanding of the task, by accurately identifying one of the important aspects of the task.
2) Generates and presents; a) Generates ideas that	Demonstrates a comprehensive understanding of the task, with all relevant ideas,	Generates 3-4 relevant, accurate, and well-developed ideas that	Generates 2 relevant, accurate, and well-developed ideas that	Generates 1 relevant, accurate, and well-developed idea that

Basis of evaluation	Score 4	Score 3	Score 2	Score 1
address the task i) $XP(X=x)$ ii) X^2 iii) $X^2P(X=x)$ iv) P_1W v) P_0W	developed accurately. i) $XP(X=x)$ ii) X^2 iii) $X^2P(X=x)$ iv) P_1W v) P_0W	address the task effectively.	address the task effectively.	address the task effectively.
b) Makes connections within and between ideas and scenario i) $\sum XP(X=x)$ ii) $\sum X^2P(X=x)$ iii) $Var(x)$ iv) Standard derivation v) $\sum P_1W$ vi) $\sum P_0W$	Shows strong and logical connections between ideas and scenario; demonstrates synthesis and depth of understanding all ideas in the scenario to task effectively. i) $\sum XP(X=x)$ ii) $\sum X^2P(X=x)$ iii) $Var(x)$	Establishes logical connections among 5-7 ideas and relates them appropriately to the scenario.	Addresses the task with 3-4 generally relevant ideas in the scenario to task effectively.	Attempts to address the task with 1-2 ideas in the scenario.

Basis of evaluation	Score 4	Score 3	Score 2	Score 1
vii) Computation of weighted average price for each year viii) New price per plate	iv) Standard derivation $\sum P_1W$ v) $\sum P_0W$ vi) Computation of weighted average price for each year vii) New price per plate viii)			
c)Presents ideas coherently i) Writes titles ii) Labels columns iii) X iv) $P(X=x)$ v) $XP(X=x)$ vi) X^2	10-12 ideas are presented in a clear, logical , and fluent manner; transitions are smooth and enhance meaning; i) Writes titles ii) Labels columns	7-9 ideas are presented coherent with logical sequencing and clear transitions .	4-6 ideas are presented coherently with logical sequencing and clear transitions .	1-3 ideas coherent with logical sequencing and clear transitions

Basis of evaluation	Score 4	Score 3	Score 2	Score 1
vii) $X^2P(X=x)$ viii) P_1W ix) P_0W x) $\sum XP(X=x)$ xi) $\sum X^2P(X=x)$ xii) $Var(x)$ xiii) Standard derivation xiv) $\sum P_1W$ xv) $\sum P_0W$ xvi) Computation of weighted average price for each year xvii) New price per plate	iii) X iv) $P(X=x)$ v) $XP(X=x)$ vi) X^2 vii) $X^2P(X=x)$ viii) P_1W ix) P_0W x) $\sum XP(X=x)$ xi) $\sum X^2P(X=x)$ xii) $Var(x)$ xiii) Standard derivation xiv) $\sum P_1W$ xv) $\sum P_0W$ xvi) Computation of weighted average price for each year xvii) New price per plate			

Basis of evaluation	Score 4	Score 3	Score 2	Score 1
3. Making Informed Judgement a) Makes informed decisions about funding the nutrition lunch b) Makes conclusion about new price per plate based on justification from result.	Forms two conclusions that are highly informed, insightful, and well-reasoned; based on comprehensive understanding and application of knowledge. i) Makes informed decisions about funding the nutrition lunch ii) Makes conclusion about new price per plate-based justification from result.	Forms one conclusion that is clear, logical, and supported by relevant evidence; shows sound understanding and some evaluation though less deep; i) Makes informed decisions about funding the nutrition lunch. ii) Makes conclusion	Forms two conclusion that is generally relevant and based on knowledge; reasoning is adequate but lacks depth or justification i) Makes informed decisions about funding the nutrition lunch. ii) Makes conclusion about new	Forms one conclusion that shows limited use of knowledge; reasoning is weak with minimal evidence or clarity i) Makes informed decisions about funding the nutrition lunch. ii) Makes conclusion about new



Basis of evaluation	Score 4	Score 3	Score 2	Score 1
		about new price per plate-based justification from result.	price per plate-based justification from result.	price per plate-based justification from result.

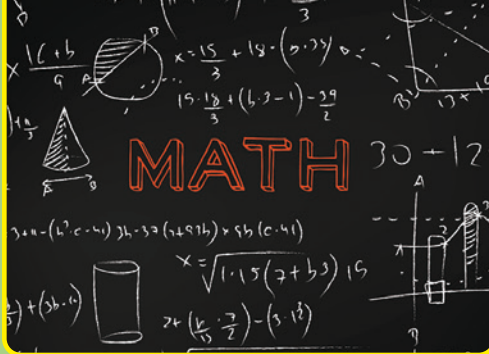


5. Performance Level Descriptors

Construct	Performance level	Descriptor
GEOMETRY Analysis of spatial relationships to solve real-life problems	Exceptional	The learner demonstrates a critical understanding of geometry concepts. They can expertly apply theorems, construct complex proofs and solve challenging problems with precision and clear reasoning.
	Outstanding	The learner shows a strong grasp of geometric concepts. They successfully apply theorems and complete most proofs with minimum difficulty.
	Satisfactory	The learner understands the basic principles of geometry, but has inconsistent application. They can handle fundamental calculations with few gaps in comprehension.
	Basic	The learner's understanding of geometry concepts is limited and below the expected standard. They struggle with applying key theorems and make frequent computational errors.
	Elementary	The learner demonstrates a fundamental lack of understanding of core geometric concepts. Performance is insufficient, with an inability to complete basic calculations.

CALCULUS Analysis and modeling of change and accumulation in real – life situations	Exceptional	The learner demonstrates a critical understanding of calculus and differential equations concepts, showing mastery of the skills.
	Outstanding	The learner shows strong and proficient grasp of calculus and differential equations concept. The score reflects only minor gaps in the application of the skills.
	Satisfactory	The learner has a basic competent understanding of calculus and differential equations principles. However, the number of errors suggests some difficulty in handling more complex problems.
	Basic	The learner demonstrates a limited understanding of calculus and differential equations concepts and a consistent inability to apply key concepts correctly.
	Elementary	The learner demonstrates a fundamental lack of comprehension of calculus and differential equations with very significant errors.
ALGEBRA Applies symbolic reasoning and generalisations to solve problems and model relationships in	Exceptional	The learner confidently manipulates algebraic expressions; pattern recognition applying symbolic reasoning and makes predictions with precision.
	Outstanding	The learner effectively manipulates algebraic expressions, pattern recognition, and connects these concepts to their graphical representations.

real-world situations.	Satisfactory	The learner satisfactorily solves algebraic expressions, performs pattern recognition and makes simple predictions.
	Basic	The learner demonstrates limited understanding in solving algebraic expressions and performs basic pattern recognition and making predictions with inconsistent accuracy.
	Elementary	The learner demonstrates very basic understanding in solving algebraic expressions and struggles with pattern recognition and making predictions with significant errors.
DATA ANALYSIS AND PROBABILITY Analysing and interpreting of data to identify trends for informed decision making and predictions in uncertain situation.	Exceptional	The learner critically evaluates data, uses analytical methods, and draws well justified conclusions.
	Outstanding	The learner accurately interprets data, performs statistical and probability calculations to draw valid conclusions.
	Satisfactory	The learner satisfactorily interprets data, and solves simple statistical and probability problems.
	Basic	The learner demonstrates limited skills in identifying basic data and performing simple calculations with inconsistent accuracy.
	Elementary	The learner shows a very basic understanding, struggling to identify even simple data and performs calculations with significant errors.



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