



آغا خان یونیورسٹی ایگزامینیشن بورڈ  
AGA KHAN UNIVERSITY EXAMINATION BOARD

Pacing Guide for Teachers

# GENERAL MATHEMATICS

Grade X

Number of weeks: 28

Number of periods per week: 5

Key Textbook: General Mathematics 9 By Ali Brothran, Lahore  
And General Mathematics 10 By Ali Brothran, Lahore

Teacher Developer(s): Atifa Aleem and Rahila Shams

Institution(s): The Mama Parsi Girls Secondary School, Karachi  
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## Topic

14. Algebraic Manipulation

## Total Periods

11

Sub-Topic	Range of SLOs	Periods (40 mins)
14.1 Highest common factor and lowest common factor	14.1.1	2
	14.1.2	3
	14.1.3	2
14.2 Basic Operation on Algebraic Fractions	14.2.1	2
14.3 Square root of algebraic expression	14.3.1	2

## Learning Resources

- Mathematics for IX by Sindh Textbook Board (Unit 5)
- Mathematics for IX by Punjab Textbook Board (Unit 6)

## Web Resource

<https://www.purplemath.com/modules/radicals2.htm>

## Suggested Activities and/or Formative Assessment

### Activity 1:

#### Algebraic Puzzles

Create algebraic puzzles using manipulatives such as tiles or blocks. For example, give students a set of tiles that represent variables and constants and ask them to

arrange them to form an equation. You can also give them equations and ask them to rearrange the tiles to simplify or solve the equation.

Equation Balancing: Give students equations that are not balanced and ask them to manipulate the terms on both sides of the equation to make it balanced. You can make this more challenging by adding variables or fractions to the equations.

## **Activity 2:**

### **Collaborative Learning**

Assign group projects that require students to work together to solve algebraic manipulation problems. This helps students develop communication and teamwork skills while also promoting a deeper understanding of the concept.

FOR ACADEMIC YEAR 2023 AND ONWARDS

## Topic

## Total Periods

15. Linear Equations and Inequalities

8

Sub-Topic	Range of SLOs	Periods (40 mins)
15.1 Linear Equations	15.1.1-15.1.3	2
	15.1.4-15.1.5	2
15.2 Equation involving absolute value	15.2.1-15.2.2	1
15.3 Linear Inequalities	15.3.1-15.3.2	1
15.4 Solving linear inequalities	15.4.1-15.4.2	2

## Learning Resources

- New Syllabus Mathematics Book 1, 7th Edition (Unit 5)
- Mathematics for Grade IX Science Group by Punjab Textbook Board (Unit 7)

## Web Resource

<http://www.purplemath.com/modules/ineqsolv.htm>

## Suggested Activities and/or Formative Assessment

### Activity 1:

#### Solving Linear Equations Relay Race

Divide the class into teams and set up a relay race where each team has to solve a linear equation before passing the baton to the next team member. The first team to complete all the equations wins.

## **Activity 2:**

### **Performance Tasks**

Have students complete a task that requires them to apply their knowledge of linear equations and inequalities, such as creating a budget or analyzing a real-world scenario. This can be done individually or in small groups.

## **Activity 3:**

### **Formative Assessments**

Throughout the unit, give students short quizzes or prompts that assess their understanding of specific concepts related to linear equations and inequalities. Use this information to adjust instruction or provide additional support where needed.

FOR ACADEMIC YEAR 2023 AND ONWARDS

## Topic

16. Quadratic Equations

## Total Periods

9

Sub-Topic	Range of SLOs	Periods (40 mins)
16.1 Quadratic Equation	16.1.1-16.1.2	1
16.2 Solution of Quadratic Equations	16.2.1	3
16.3 Quadratic Formula	16.3.1-16.3.3	5

## Learning Resource

- Mathematics IX and X by Caravan Publication (Unit 1)

## Suggested Activities and/or Formative Assessment

### Activity 1:

#### Interactive Whiteboard

Use an interactive whiteboard to display quadratic equations and allow students to manipulate the equation by changing the coefficients or constants. This can help them understand how changes to the equation affect the graph.

### Activity 2:

#### Rubrics

Use a rubric to assess student understanding and performance on tasks and assignments related to quadratic equations. The rubric should include specific criteria and standards for assessment.

### Activity 3:

#### Error Analysis

Give students a set of quadratic equations and solutions, some of which contain errors. Ask them to identify and explain the errors. This activity not only assesses their understanding of quadratic equations but also their ability to analyze and identify mistakes.

FOR ACADEMIC YEAR 2023 AND ONWARDS

## Topic

13. Basic Statistics

## Total Periods

20

Sub-Topic	Range of SLOs	Periods (40 mins)
13.1 Frequency Distribution and Graphs	13.1.1-13.1.2	5
	13.1.3 -13.1.4	5
13.2 Cumulative Frequency Distribution	13.2.1-13.2.2	2
13.3 Measure of Central Tendency	13.3.1-13.3.2	5
13.4 Measure of Dispersion	13.4.1	3

## Learning Resources

- New Syllabus Mathematics Book 1 (Unit 15)
- GeoGebra Classes

## Web Resource

<http://www.mathsisfun.com/data/in>

## Suggested Activities and/or Formative Assessment

### Activity 1:

#### Group Whiteboard Exercise

Divide the class into groups and ask them to draw a graph or chart that represents a real-life scenario using basic statistical concepts they learned in class. Have them



present their work to the class and explain the concepts they used. This will help assess if they have a clear understanding of how to apply statistical concepts to real-world scenarios. Data collection project: Have students collect and analyse data on a topic of their choice, such as favorite colors, hobbies, or types of music. They can then create charts, graphs, and tables to display their findings.

## **Activity 2:**

### **Peer assessment**

Have students assess each other's work and provide feedback on their understanding of statistical concepts.

FOR ACADEMIC YEAR 2023 AND ONWARDS

## Topic

18. Fundamentals Of Geometry

## Total Periods

26

Sub-Topic	Range of SLOs	Periods (40 mins)
18.1 Properties of Angles	18.1.1-18.1.3	4
18.2 Parallel Lines	18.2.1-18.2.3	6
18.3 Congruent and Similar-Triangles	18.3.1-18.3.2	6
18.4 Quadrilaterals	18.4.1-18.4.3	3
18.5 Circle	18.5.1-18.5.3	7

## Learning Resources

- New Syllabus Mathematics Book 1 (Unit 10)
- New Syllabus Mathematics Book 2 (Unit 8)
- New Syllabus Book 3 (Unit 13)
- GeoGebra Classroom Resources

## Web Resource

[www.mathsisfun.com/geometry/parallel-lines.html](http://www.mathsisfun.com/geometry/parallel-lines.html)

# **Suggested Activities and/or Formative Assessment**

## **Activity 1:**

### **Geometric art**

Have students create art using geometric shapes. This activity can help students develop their spatial reasoning and creativity.

## **Activity 2:**

### **Digital assessments**

Use digital tools, such as online quizzes or interactive simulations, to assess students' understanding of geometry concepts in a fun and engaging way.

## **Activity 3:**

### **Performance Tasks**

Create performance tasks that require students to demonstrate their understanding of theorems of circles through hands-on activities. For example, students could design and build a model of a Ferris wheel or carousel that incorporates the principles of circles.

## Topic

## Total Periods

17. Arithmetic and Geometric Sequence

13

Sub-Topic	Range of SLOs	Periods (40 mins)
17.1 Sequence	17.1.1-17.1.2	2
17.2 Arithmetic Sequence	17.2.1-17.2.2	3
17.3 Arithmetic Mean	17.3.1-17.3.2	2
17.4 Geometric Sequence	17.4.1-17.4.2	3
17.5 Geometric Mean	17.5.1-17.5.2	3

## Learning Resources

- Mathematics 11 ILM ki Duniya Unit (7)

## Web Resource

<https://www.mathsisfun.com/algebra/sequences-sums-arithmetic.html>

# **Suggested Activities and/or Formative Assessment**

## **Activity 1:**

### **Interactive activities**

Use online interactive activities, such as Kahoot or Quizlet, to assess student understanding of arithmetic and geometric.

## **Activity 2:**

### **Arithmetic and Geometric Sequence Match-Up**

Give students a set of cards with arithmetic and geometric sequences written on them. Have them match the correct sequence to its formula or to a graph of the sequence.

FOR ACADEMIC YEAR 2023 AND ONWARDS

## Topic

19. Areas and Volumes

## Total Periods

22

Sub-Topic	Range of SLOs	Periods (40 mins)
19.1 Pythagoras' Theorem	19.1.1-19.1.2	2
19.2 Areas	19.2.1-19.2.3	6
	19.2.4	4
19.3 Volumes	19.3.1-19.3.2	10

## Learning Resources

- New Syllabus Mathematics Book 2 (Unit 12 and Unit 13)
- New Syllabus Mathematics Book 1 (Unit 10 and 14)
- GeoGebra Classroom Resources

## Web Resource

<http://www.cut-the-knot.org/pythagoras/index.shtml>

## Suggested Activities and/or Formative Assessment

### Activity 1:

#### Visual aids

Use visual aids such as pictures, diagrams, and 3D models to explain the concepts of area and volume. This will make it easier for students to visualise and understand the concepts.

## Activity 2:

### Use a Think-Pair-Share

A think-pair-share is an effective way to engage students in problem-solving. You can pose a problem to the class, and students can take a few minutes to think about their answer. Then, students can pair up with a partner to discuss their ideas and come up with a solution. Finally, each pair can share their ideas with the class.

FOR ACADEMIC YEAR 2023 AND ONWARDS

## Topic

## Total Periods

20. Introduction to Coordinate Geometry

8

Sub-Topic	Range of SLOs	Periods (40 mins)
20.1 Distance Formula	20.1.1-20.1.3	3
20.2 Collinear Points	20.2.1-20.2.2	3
20.3 Midpoint Formula	20.3.1-20.3.2	2

## Learning Resources

- Mathematics Grade IX Punjab Textbook Board (Unit 9)
- GeoGebra Classroom Resources

## Web Resource

<http://www.mathopenref.com/coordintro.html>

## Suggested Activities and/or Formative Assessment

### Activity 1:

#### Design a Rollercoaster

Students work in pairs or small groups to design a rollercoaster using the coordinate plane. They must include loops, hills, and turns, and calculate the slope and distance of each section. They can then present their rollercoaster designs to the class.

### Activity 2:

#### Coordinate Battleship

This is a fun game where students plot coordinates on a grid and try to guess the location of their opponent's ships. The game can be modified to include different types of coordinates, such as polar or spherical coordinates, to test the student's understanding of different coordinate systems.



## Topic

11. Financial Mathematics

## Total Periods

10

Sub-Topic	Range of SLOs	Periods (40 mins)
11.1 Commercial Banking	11.1.1-11.1.3	3
11.2 Exchange of Currencies	11.2.1	2
11.3 Simple Interest	11.3.1-11.3.2	2
11.4 Financing	11.4.1-11.4.2	3

## Learning Resource

- New Syllabus Mathematics Book 3 Unit 5

## Suggested Activities and/or Formative Assessment

### Activity 1:

#### Banking Activity

Provide students with a bank statement and ask them to calculate interest earned on a savings account over a certain period of time. They can also calculate loan interest, APR, and monthly payments. This activity can help students understand how to manage their money in a bank account, and also help them practice important math skills like interest rates, compounding, and simple and compound interest calculations.

## **Activity 2:**

### **Loan Analysis Project**

Have students research different types of loans, such as car loans or student loans, and analyse the terms, interest rates, and payment schedules to determine the best option for a hypothetical scenario.

## **Activity 3:**

### **Stock Market Game**

Have students participate in a simulated stock market game, where they research and invest in various stocks and track their performance over time.

FOR ACADEMIC YEAR 2023 AND ONWARDS

## Topic

12. Consumer Mathematics

## Total Periods

13

Sub-Topic	Range of SLOs	Periods (40 mins)
12.1 Taxes	12.1.1-12.1.4	6
12.2 Utility Bills	12.2.1	3
12.3 Personal Income	12.3.1-12.3.3	4

## Web Resource

<https://www.ipracticemath.com/learn/consumermath>

## Suggested Activities and/or Formative Assessment

### Activity 1:

#### Budgeting Activity

Provide students with a realistic scenario such as planning a monthly budget for a household with given income, expenses and savings goals. Students can create their own budget spreadsheet and use it to calculate expenses, income, savings, and balance. This activity can help students understand how to plan and manage their finances, and also help them practice important math skills like addition, subtraction, multiplication, and division.

### Activity 2:

Provide students with a restaurant menu and ask them to calculate the total bill including taxes, tips, and discounts. They can also practice splitting the bill and calculating individual share.

**Note:** This teacher-led pacing guide has been developed for AKU-EB affiliated schools to facilitate them by

- ensuring smooth transition of a school's academic year.
- ensuring curricular continuity in schools.
- predicting the time and pace of syllabi implementation.

This document also contains **suggested activities and/or formative assessments** that may enhance the learning experience. Please note that these activities are meant to serve as suggestions. As educators, you have the flexibility and autonomy to adapt and modify them to best suit the needs of your students and the dynamics of your classroom.

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FOR ACADEMIC YEAR 2023 AND ONWARDS