AGA KHAN UNIVERSITY EXAMINATION BOARD

Pacing Guide for Teachers

Mathematics

Grade XII

Number of weeks: 28

Number of periods per week:6

Key Textbook: Mathematics for Grade 12, Punjab Textbook Board

Teacher Developer(s): Muhammad Nasir Humayun and Uroosa Manzar

Institution(s): Aga Khan Higher Secondary School, Karachi and

Bai Virbaiji Soparivala Parsi High School, Karachi

Topic   Total Periods

12. Functions and Limits   23

Sub-Topic	Range of SLOs	Periods (40 mins)
12.1 Functions	12.1.1-12.1.2	1
12.2 Inverse Functions	12.2.1-12.2.2	3
12.3 Graph of Functions	12.3.1-12.3.3	3
12.4 Composition of Functions	12.4.1-12.4.3	2
12.5 Inverse of Composition of Functions	12.5.1-12.5.2	2
12.6 Types of Functions	12.6.1-12.6.3	3
12.7 Graphical Representations	12.7.1-12.7.3	3
12.8 Limit of a Function	12.8.1-12.8.8	2
12.9 Important Limits	12.9.1-12.9.3	2
12.10 Continuous and Discontinuous Functions	12.10.1-12.10.4	2

Learning Resource

- Turbo math's Grade 12 - Page 44

Suggested Activities and/or Formative Assessment

Activity 1:

Brain Storming Quiz

A popup quiz can be conducted to evaluate prior knowledge of students regarding function.

Activity 2

Class Discussions

1) Discuss using Table or different type of function can for explaining this topic

2) Discuss the difference between Relation and Functions with different examples
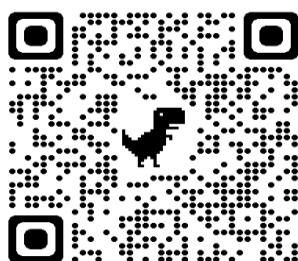
Activity 3

Assessment Based Work Sheet

The learner will be able to answer the essential questions. Using different strategies to solve the questions.

Further Resources

For additional resources related to formative assessments, please refer to **Learn Smart Classroom by Knowledge Platform**:

https://akueb.knowledgeplatform.com/login

Topic		Total Periods
13. Differentiation		22

Sub-Topic	Range of SLOs	Periods (40 mins)
13.1 Derivative of a Function	13.1.1-13.1.8	2
13.2 Theorems on Differentiation and their Applications	13.2.1-13.2.1	5
13.3 Chain Rule	13.3.1-13.3.4	4
13.4 Differentiation of Trigonometry and Inverse Trigonometric Function	13.4.1-13.4.3	4
13.5 Differentiation of Exponential and Logarithmic Functions	13.5.1-13.5.4	4
13.6 Differentiation of Hyperbolic and Inverse Hyperbolic Function	13.6.1-13.6.2	3

Web Resource

https://youtu.be/53R2f5PLf7k

Suggested Activities and/or Formative Assessment

Activity 1

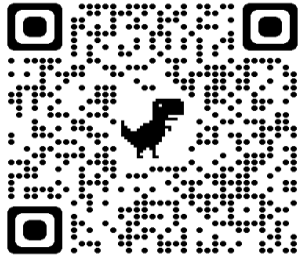**Group Work and Assessment through Collaboration**

Activity worksheets can be given to students to match equations with their components. Students can be divided into two groups and after mutual discussion

they can write the correct equations on the board. The teacher will assess after solving the questions.

Further Resources

For additional resources related to formative assessments, please refer to **Learn Smart Classroom by Knowledge Platform:**

https://akueb.knowledgeplatform.com/login

Topic

14. Higher Order Derivatives and its Application

Total Periods

12

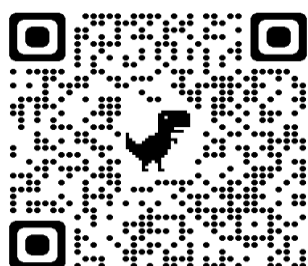| Sub-Topic	Range of SLOs	Periods (40 mins)
14.1 Higher Order Derivatives	14.1.1-14.1.3	2
14.2 Maclaurin's and Taylor's Expansions	14.2.1-14.2.3	4
14.3 Application of Derivatives	14.3.1-14.3.8	6

Learning Resource

- Additional mathematics by Cheah Tat Huat, Tan Beng Theam, Khor Gark Kim, Leong Wei Ching

Further Resources

For additional resources related to formative assessments, please refer to **Learn Smart Classroom by Knowledge Platform:**

https://akueb.knowledgeplatform.com/login

Topic	Total Periods
15. Partial Fractions	6

Sub-Topic	Range of SLOs	Periods (40 mins)
15.1 Proper and Improper Rational Fractions	15.1.1	1
15.2 Resolution of Fractions into Partial Fractions	15.2.1-15.2.2	5

Further Resources

For additional resources related to formative assessments, please refer to **Learn Smart Classroom by Knowledge Platform:**

https://akueb.knowledgeplatform.com/login

Topic   # Total Periods

16. Integration   24

Sub-Topic	Range of SLOs	Periods (40 mins)
16.1 Introduction	16.1.1-16.1.2	1
16.2 Rule of Integration	16.2.1-16.2.3	7
16.3 Integration by Substitution	16.3.1-16.3.3	4
16.4 Integration by Parts	16.4.1-16.4.3	3
16.5 Integration using Partial Fractions	16.5.1	2
16.6 Definite Integrals	16.6.1-16.6.5	4
16.7 Differential Equation	16.7.1-16.7.4	3

Learning Resource

- Additional mathematics by Cheah Tat Huat, Tan Beng Theam, Khor Gark Kim, Leong Wei Ching
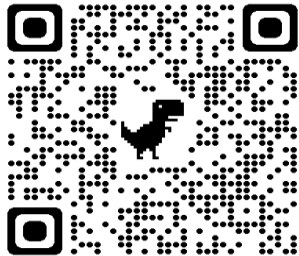
Web Resource

https://youtu.be/Z4g5k3JRwMk

Further Resources

For additional resources related to teaching, learning and formative assessments, please refer to **Learn Smart Classroom by Knowledge Platform:**

https://akueb.knowledgeplatform.com/login

Topic   Total Periods

17. Plane Analytic Geometry (Straight Line)   23

Sub-Topic	Range of SLOs	Periods (40 mins)
17.1 Division of a Segment	17.1.1-17.1.5	3
17.2 Slope of a Straight Line	17.2.1-17.2.5	3
17.3 Equation of a Straight Line Parallel to Coordinate Axes	17.3.1	1
17.4 Standard Form of Equation of a Straight Line	17.4.1-17.4.4	4
17.5 Distance of a Point from a Line	17.5.1-17.5.3	2
17.6 Angle Between Lines	17.6.1-17.6.3	2
17.7 Concurrency of Straight Lines	17.7.1-17.7.3	3
17.8 Area of a Triangular Region	17.8.1	2
17.9 Homogenous Equations	17.9.1-17.9.4	3

Learning Resource

- Higher GCSE Mathematics for EDEXCEL by Alan Smith

Further Resources

For additional resources related to formative assessments, please refer to **Learn Smart Classroom by Knowledge Platform:**

https://akueb.knowledgeplatform.com/login

Topic		Total Periods
18. Linear Programming		9

Sub-Topic	Range of SLOs	Periods (40 mins)
18.1 Introduction	18.1.1-18.1.2	1
18.2 Linear Inequalities	18.2.1-18.2.3	3
18.3 Feasible Region	18.3.1-18.3.3	3
18.4 Optimal Solution	18.4.1-18.4.3	2

Learning Resource

- Higher GCSE Mathematics for EDEXCEL by Alan Smith

Web Resource

https://youtu.be/yilcL1-9FUI

Further Resources

For additional resources related to formative assessments, please refer to **Learn Smart Classroom by Knowledge Platform**:

https://akueb.knowledgeplatform.com/login

Topic		Total Periods
19. Circle		10

Sub-Topic	Range of SLOs	Periods (40 mins)
19.1 Introduction	19.1.1	1
19.2 Equation of Circle	19.2.1-19.2.7	5
19.3 Tangents and Normal	19.3.1-19.3.7	4

Learning Resource

- Higher GCSE Mathematics for EDEXCEL by Alan Smith
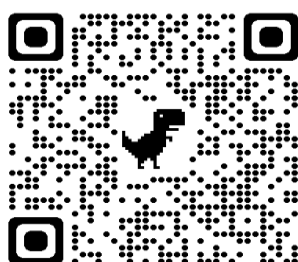- Turbo Math's Grade 12 - Page 44
- Use DESMOS, GeoGebra

Web Resources

https://www.cuemath.com/geometry/conic-sections/

Further Resources

For additional resources related to formative assessments, please refer to **Learn Smart Classroom by Knowledge Platform**:

https://akueb.knowledgeplatform.com/login

Topic

20. Parabola

Total Periods

7

Sub-Topic	Range of SLOs	Periods (40 mins)
20.1 Introduction	20.1.1	1
20.2 Equation of a Parabola	20.2.1-20.2.4	2
20.3 Tangents and Normal	20.3.1-20.3.2	3
20.4 Uses of Parabola in Daily Life	20.4.1-20.4.2	1

Web Resource

https://youtu.be/jmN0wsqGAGs

Activity 1

Use DESMOS and GeoGebra to explore the topic.

Further Resources

For additional resources related to formative assessments, please refer to **Learn Smart Classroom by Knowledge Platform:**

https://akueb.knowledgeplatform.com/login

Topic	Total Periods
21. Ellipse	6

Sub-Topic	Range of SLOs	Periods (40 mins)
21.1 Introduction	21.1.1-21.1.2	1
21.2 Equation of an Ellipse	21.2.1-21.2.5	2
21.3 Tangents and Normals	21.3.1-21.3.2	3

Further Resources

For additional resources related to formative assessments, please refer to **Learn Smart Classroom by Knowledge Platform:**

https://akueb.knowledgeplatform.com/login

	Topic	Total Periods

Topic

22. Hyperbola

Total Periods

6

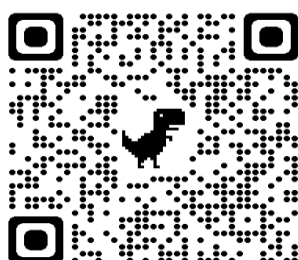| Sub-Topic	Range of SLOs	Periods (40 mins)
22.1 Introduction	22.1.1	1
22.2 Equation of Hyperbola	22.2.1-22.2.5	2
22.3 Tangents and Normals	22.3.1-22.3.2	3

Web Resource

https://youtu.be/Bo8Shotn4Sw

Further Resources

For additional resources related to formative assessments, please refer to **Learn Smart Classroom by Knowledge Platform:**

https://akueb.knowledgeplatform.com/login

Topic	**Total Periods**
23. Translation and Rotation	3

Sub-Topic	Range of SLOs	Periods (40 mins)
23.1 Translation and Rotation of Axes	23.1.1-23.1.5	3

Further Resources

For additional resources related to teaching, learning and formative assessments, please refer to **Learn Smart Classroom by Knowledge Platform:**

https://akueb.knowledgeplatform.com/login

Topic	Total Periods
24. Vectors	11

Sub-Topic	Range of SLOs	Periods (40 mins)
24.1 Vectors in a Plane	24.1.1-24.1.8	1
24.2 Vectors in Space	24.2.1-24.2.7	2
24.3 Dot or Scalar Product	24.3.1-24.3.11	3
24.4 Cross or Vector Product	24.4.1-24.4.10	3
24.5 Scalar Triple Product	24.5.1-24.5.8	2

Learning Resource

- Higher GCSE Mathematics for EDEXCEL by Alan Smith

Web Resources

https://youtu.be/KJyEQ9ORdk0

https://youtu.be/ml4NSzCQobk
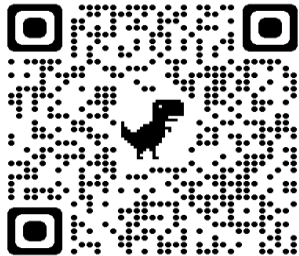
https://youtu.be/Ej3ZVxIjJfo

https://youtu.be/5jc6eNWOmwU

Further Resources

For additional resources related to formative assessments, please refer to **Learn Smart Classroom by Knowledge Platform:**

https://akueb.knowledgeplatform.com/login

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.

You are advised to use an ad-blocker while accessing the websites and web resources. In case any website is not functional for any reason, you may inform us at examination.board@aku.edu for an alternative or search material via any search engine.