AGA KHAN UNIVERSITY EXAMINATION BOARD

Teaching and Learning Resources for Grade XI Mathematics

Recommended Key Textbook:

Mathematics for Grade 11, Punjab Text Book Board

Additional Recommended Resource Material				
Topic No.	Topic Title	Reference Book	Topic in the Reference Book	Website
1.	Complex Number	*Mathematics* XI, Punjab Text Book Board	1. Number Systems	
		Introductory Complex Analysis By Richard A. Silverman (Dover Publication, Inc. New York)		
2.	Matrices and Determinants	*Mathematics* XI, Punjab Text Book Board	3. Matrices and Determinants	
		Textbook of Matrix Algebra (Third Edition) by Suddhendu Biswas (PHI Learning Private Limited, India)		
		Elementary Linear Algebra by Howard Anton and Chris Rorres10th Edition (2010) John Wiley & Sons, Inc. USA.	Chapter 2: Determinants	

Topic No.	Topic Title	Reference Book	Topic in the Reference Book	Website
3.	Sequences and Series	*Mathematics* XI , Punjab Text Book Board	6. Sequences and Series	
		College Algebra and Trigonometry: A Basic Integrated Course by Frederic Howell Miller		
		Schaum's Outline of College Algebra, Third Edition By Murray Spiegel, Robert E. Moyer (Schaum's Outline Series, Mc Graw Hill, New York)		
4.	Miscellaneous Series	*Mathematics* XI, Punjab Text Book Board	6. Sequences and Series	
		Summation of Series edited by L.B. W. Jolley (Dover Publication, Inc, Mineola, New York)		
5.	Permutation, Combination and Probability	*Mathematics* XI, Punjab Text Book Board	7. Permutation, Combination and Probability	
		Schaum's Outline of College Algebra, Third Edition by Murray Spiegel, Robert E. Moyer (Schaum's Outline Series, Mc Graw Hill, New York)		

Topic No.	Topic Title	Reference Book	Topic in the Reference Book	Website
		Combinations, Permutations, Probabilities by Anthony Nicolaides (P.A.S.S. Publication – Private Academic & Scientific Studies, Ltd, UK)		
6.	Mathematical Induction and Binomial	*Mathematics* XI, Punjab Text Book Board	8. Mathematical Induction and Binomial Theorem	
		Comprehensive Mathematics XI by Parmanand Gupta (Laxmi Publication Private Ltd, India)		
7.	Quadratic Equations	*Mathematics* XI, Punjab Text Book Board	4. Quadratic Equations	
		Algebra to Quadratic Equations by E. Atkins (Collins' School Series) by Edward Atkins (William Collins, Sons & Company)		
		Mathematics: quadratic equations. How solve a quadratic equation. By Marilù Garo		

Topic No.	Topic Title	Reference Book	Topic in the Reference Book	Website
8.	Introduction to Trigonometry and Trigonometric Identities	*Mathematics* XI, Punjab Text Book Board	9. Fundamentals of Trigonometry. 10. Trigonometric Identities Sum and Difference of Angles	
9.	Application of Trigonometry	*Mathematics* XI, Punjab Text Book Board	12. Applications of Trigonometry	
10.	Graphs of Trigonometric, Inverse Trigonometric Functions and Solution of Trigonometric Equations	*Mathematics* XI, Punjab Text Book Board	11. Trigonometric Functions and their Graphs 13. Inverse Trigonometric Functions 14. Solutions of Trigonometric Equations	
		Schaum's Outline of Trigonometry, 5th Edition: 618 Solved Problems + 20 Videos By Robert E. Moyer, Frank Ayres		
		Trigonometry By I.M. Gelfand, Mark Saul (Birkhauser – Boston, Basel, Berlin)		
		Trigonometry (Plane and Spherical) George P. Putnam & Co. New York)		
		Plane Trigonometry by S. L. Loney (Cambridge University Press)		

Topic No.	Topic Title	Reference Book	Topic in the Reference Book	Website
		College Trigonometry by Richard N. Aufmann, Vernon C. Barker, Richard D. Nation (Houghton Mifflin Company, New York)		
		Teach Yourself Trigonometry by Percival Abbott English Universities Press, 1970		
11.	Introduction to Symbolic Package Maple	*Maple by Example* by Martha L. Abell, James P. Braselton		
12.	Functions and Limits	*An Introduction to the Concepts of Function and Limit* by Harold J. Medici (Reed College, 1962)	1. Functions and Limits	https://www.coursera.org/learn/single-variable-calculus https://www.coursera.org/learn/differentiation-calculus
		Calculus Single Variable by Howard Anton, Irl Bivens, Stephen Davis (John Wiley & Sons, Inc, USA)		https://www.coursera.org/learn/integration-calculus
		Calculus And Analytical Geometry,9/e by Thomas (Pearson Education, Inc and Dorling Kindersley Publishing Inc.)		https://www.coursera.org/learn/applications-calculus https://www.coursera.org/learn/discrete-calculus

Note: This resource list has been prepared primarily for teachers. While it can be shared with students, students should not be required to buy multiple books. Schools are encourages to stock these books in the library. Moreover, these are only suggestions which have been compiled for the ease of teachers and students; schools are encouraged to use other resources for teaching and learning as well, as long as they are in line with the student learning outcomes (SLOs) mentioned in AKU-EB syllabi. Unless specified, AKU-EB does not endorse any of these books or websites. You are advised to use an ad-blocker while accessing the websites. 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. If you have any query, please contact us via email.

Teaching and Learning Resources for Grade XII Mathematics

Recommended Key Textbook:

Mathematics for Grade 12, Punjab Text Book Board

	Additional Recommended Resource Material			
Topic No.	**Topic Title**	**Reference Book**	**Topic in the Reference Book**	**Website**
13.	Differentiation	*Mathematics* XII, Punjab Text Book Board	2. Differentiation (Article 2.1 to 2.14)	
14.	Higher Order Derivatives and its Applications	*Mathematics* XII, Punjab Text Book Board	2. Differentiation (Article 2.15 to 2.21)	
		Differential equations and their applications by Zafar Ahsan (PHI Learning Private Limited, India)		
15.	Partial Fractions	*Mathematics* XII, Punjab Text Book Board	3. Integration (Article 3.5)	
		Schaum's Outline of College Algebra by Murray R. Spiegel, Robert E. Moyer (Schaum's Outline Series, Mc Graw Hill, New York)	31. Partial Fractions (page #: 367)	

Topic No.	Topic Title	Reference Book	Topic in the Reference Book	Website
16.	Integration	*Mathematics* XII, Punjab Text Book Board	3. Integration	
		Introduction to Integral Calculus: Systematic Studies with Engineering Applications for Beginners by Ulrich L. Rohde, G. C. Jain, Ajay K. Poddar, A. K. Ghosh (John Wiley & Sons, Inc., Publication)		
		Advanced Engineering Mathematics by H. K. Dass S. Chand & company, Ram nagar, New Delhi, India		
17.	Plane Analytic Geometry (Straight Line)	*Mathematics* XII, Punjab Text Book Board	4. Introduction to Analytic Geometry	
		The Elements of Coordinate Geometry by SL Loney (Macmillan and Co. London & New York)		
		Plane Analytic Geometry: Two Dimension Analytic Geometry (Kindle Edition) by Marcos Olandoski		

Topic No.	Topic Title	Reference Book	Topic in the Reference Book	Website
18.	Linear Programming	*Mathematics* XII, Punjab Text Book Board	5. Linear inequalities and Linear Programming	https://www.coursera.org/course/linearprogramming
		Operations Research by Panneerselvan, R ISBN: 978-81-203-2928-7 Publisher: PHI; 2nd edition edition (January 30, 2006)	Chapter 1: Overview of Operations Research. Chapter 2: Linear Programming.	https://www.youtube.com/results?search_query=mathematics+linear+programming
		Operation Research: An Introduction by Hamdy A. Taha 9th edition (2010), Prentice Hall	Chapter 1. What is operation research Chapter 2. Modeling with Linear Programming	
19.	Circles	*Mathematics* XII, Punjab Text Book Board	6. Conic Section (Articles 6.1 – 6.3)	
20.	Parabola	*Mathematics* XII, Punjab Text Book Board	6. Conic Section (Articles 6.4)	
21.	Ellipse	*Mathematics* XII, Punjab Text Book Board	6. Conic Section (Articles 6.5)	
22.	Hyperbola	*Mathematics* XII, Punjab Text Book Board	6. Conic Section (Articles 6.6 and 6.7)	

Topic No.	Topic Title	Reference Book	Topic in the Reference Book	Website
23.	Translation and Rotation	*Mathematics* XII, Punjab Text Book Board	6. Conic Section (Articles 6.8 and 6.9)	
		Conic Section - Treated Geometrically (Cambridge Mathematical Series) by W. H. Besant, 9th Edition (1895) George Bell and Sons, London		
		Text Book Of Conic Section by A.K. Sharma (2005), Discovery Publishing House, New Dehli, India	Chapter 1. The General Equation of the Second Degree	
		An easy introduction to the higher treatises on the conic sections [With] Key by John Hunter (Longmans, Green, and Co. London)		
		Schaum's Analytic Geometry (Schaum's Outline) by J. H. Kindle (Schaum's Outline Series, Mc Graw Hill, New York)		
24.	Vectors	*Mathematics* XII, Punjab Text Book Board	6. Vectors	
		Vector and Tensor Analysis for Scientists and Engineers by Prof. Dr. Nawazish Ali Shah A-One Publisher, Urdu Bazar, Lahore. www.aonepublishers.com	Chapter 1.: Algebra of Vectors Chapter 2: Geometry of Vectors	

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Other Reference books

Calculus Single Variable by Howard Anton, Irl Bivens, Stephen Davis (John Wiley & Sons, Inc, USA)

Calculus And Analytical Geometry,9/e
by Thomas (Pearson Education,Inc and Dorling Kindersley Publishing Inc.)

Some valuable and useful website for teachers and students

- http://www.mathcity.org/fsc
- http://ocw.mit.edu/courses/mathematics/
- https://www.edx.org/course/subject/math
- https://www.mathsisfun.com/
- https://www.khanacademy.org/
- https://www.coursera.org/