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Advanced Topics Mathematics   2019-2020

	Week	Major Concepts / Topics	Possible Resources
Quarter 1 Aug 12 – Oct 11	1 8/12 – 8/16	Chapter 1 – Equations and Inequalities • Lesson 1.1 – Graphs and Graphing Utilities • Lesson 1.2 – Linear Equations and Rational Equations	Graphing linear functions – Khan Academy Solving rational equations – Khan Academy Interpreting graphs of linear and nonlinear functions – Khan Academy
	2 8/19 – 8/23	Chapter 1 – Equations and Inequalities • Lesson 1.3 – Models and Applications Chapter 2 – Functions and Graphs • Lesson 2.1 – Basics of Functions and Their Graphs	Graphing word problems – Khan Academy Modeling with combined functions – Khan Academy Even, odd functions – Khan Academy
	3 8/26 – 8/30	Chapter 2 – Functions and Graphs • Lesson 2.2 – More on Functions and Their Graphs • Lesson 2.3 – Linear Functions and Slope	Shifting and reflecting functions – Khan Academy Graphing linear functions word problems – Khan Academy
	4 9/3 – 9/6	Chapter 2 – Functions and Graphs • Lesson 2.4 – More on Slope • Lesson 2.5 – Transformations of Functions	Recognizing slope of curves – Khan Academy Shifting and reflecting functions – Khan Academy
	5 9/9 – 9/13	Chapter 2 – Functions and Graphs • Lesson 2.6 – Combinations of Functions; Composite Functions • Lesson 2.7 – Inverse Functions	Compose functions – Khan Academy Inverses of linear functions – Khan Academy
	6 9/16 – 9/20	Chapter 5 – Trigonometric Functions • Lesson 5.1 – Angles and Radian Measure • Lesson 5.2 – Right Triangle Trigonometry	Radians and arc length – Khan Academy Right Triangles and Trigonometry – Khan Academy
	7 9/23 – 9/27	Chapter 5 – Trigonometric Functions • Lesson 5.2 – Right Triangle Trigonometry • Lesson 5.8- Applications of Trigonometric Functions • Lesson 5.3 – Trigonometric Functions of Any Angle	Trig functions and side ratios in right triangles – Khan Academy Modeling with trigonometric functions – Khan Academy Unit circle trigonometry – Khan Academy
	8 9/30 – 10/4	Chapter 5 – Trigonometric Functions • Lesson 5.4 – Trigonometric Functions of Real Numbers; Periodic Functions	Symmetry and periodicity of trigonometric functions – Khan Academy
	9 10/7 – 10/11	Chapter 5 – Trigonometric Functions • Lesson 5.5 – Graphs of Other Trigonometric Functions	Graphs of trigonometric functions – Khan Academy

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	Week	Major Concepts / Topics	Possible Resources
Quarter 2 Oct 15 – Dec 20	1 10/15 – 10/18	Chapter 5 – Trigonometric Functions • Lesson 5.6 – Graphs of Other Trigonometric Functions • Lesson 5.7 – Inverse Trigonometric Functions	Symmetry and periodicity of trigonometric functions – Khan Academy Inverse trig word problems – Khan Academy
	2 10/21 – 10/25	Chapter 5 – Trigonometric Functions • Lesson 5.7 – Inverse Trigonometric Functions • Lesson 5.8 – Applications of Trigonometric Functions • Assessment Chapter 6- Analytic Trigonometry • Lesson 6.1 – Verifying Trigonometric Identities	Modeling with trigonometric functions – Khan Academy Manipulating trig expressions with Pythagorean identities – Khan Academy
	3 10/28 – 11/1	Chapter 6 – Analytic Trigonometry • Lesson 6.2 – Sum and Difference Formulas • Lesson 6.3 – Double-Angle, Power-Reducing, and Half-Angle Formulas • Assessment	Addition and subtracting trig identities – Khan Academy Applying angle addition formulas – Khan Academy Trigonometric Identity Review – Khan Academy
	4 11/4 – 11/8	Chapter 6 – Analytic Trigonometry • Lesson 6.5- Trigonometric Equations	Solving Trigonometric Equations – Khan Academy
	5 11/12 – 11/15	Chapter 6- Analytic Trigonometry • Lesson 6.5- Trigonometric Equations Chapter 1- Equations and Inequalities • Lesson 1.4 – Complex Numbers	The imaginary unit and complex numbers – Khan Academy
	6 11/18 – 11/22	Chapter 7 – Additional Topics in Trigonometry • Lesson 7.3 – Polar Coordinates	Polar coordinates – Khan Academy
	7 11/25 – 11/26	Chapter 7 – Additional Topics in Trigonometry • Lesson 7.5 – Complex Numbers in Polar Form; DeMoivre's Thoerem	DeMoivre's Theorem - YouTube
	8 12/2 – 12/6	Chapter 7 – Additional Topics in Trigonometry • Lesson 7.4 – Graphs and Polar Equations	Complex numbers; Polar form – Khan Academy
	9 12/9 – 12/13	Chapter 7 – Additional Topics in Trigonometry • Lesson 7.4 – Graphs and Polar Equations	Complex numbers; Polar form - Khan Academy
	10 12/16 – 12/20	• District Exams	

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Advanced Topics Mathematics 2019-2020

	Week	Major Concepts / Topics	Possible Resources
Quarter 3 Jan 6 – Mar 12	1 1/6– 1/10	Chapter 1 – Equations and Inequalities • Lesson 1.4 – Complex Numbers • Lesson 1.5 – Quadratic Equations Chapter 3 – Polynomial and Rational Functions • Lesson 3.1 – Quadratic Functions	Understanding the process for solving quadratic equations – Khan Academy Quadratic functions-Vertex Form; Quadratic Functions-Standard Form – Khan Academy
	2 1/13 – 1/17	Chapter 3 – Polynomial and Rational Functions • Lesson 3.2 – Polynomial Functions and Their Graphs • Lesson 3.3 – Dividing Polynomials; Remainder and Factor Theorems	Polynomial graphs – Khan Academy
	3 1/21 – 1/24	Chapter 3 – Polynomial and Rational Functions • Lesson 3.3 – Dividing Polynomials; Remainder and Factor Theorems • Lesson 3.4 – Zeros of Polynomial Functions	Dividing polynomials – Khan Academy Remainder Theorem – Khan Academy Zeros of Polynomials – Khan Academy
	4 1/27 – 1/30	Chapter 3 – Polynomial and Rational Functions • Lesson 3.5 – Rational Functions and Their Graphs	Graphs of rational functions – Khan Academy
	5 2/3 – 2/7	Chapter 4 – Exponential and Logarithmic Functions • Lesson 4.1 – Exponential Functions • Lesson 4.2 – Logarithmic Functions • Lesson 4.3 – Properties of Logarithms	Exponential Expressions – Khan Academy Exponential Functions – Khan Academy Using logarithms to solve exponential equations – Khan Academy Logarithms – Khan Academy Logarithm properties – Khan Academy
	6 2/10 – 2/14	Chapter 4 – Exponential and Logarithmic Functions • Lesson 4.3 – Properties of Logarithms • Lesson 4.4 – Exponential and Logarithmic Equations • Lesson 4.5 – Exponential Growth and Decay; Modeling Data	Logarithm properties – Khan Academy Modeling with exponential functions – Khan Academy Exponential growth and decay – Khan Academy
	7 2/17 – 2/21	Chapter 4 – Exponential and Logarithmic Functions • Lesson 4.5 – Exponential Growth and Decay; Modeling Data	Exponential growth and decay word problems – Khan Academy

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	8 2/24 – 2/28	Chapter 9 – Matrices and Determinants • Lesson 9.3 – Matrix Operations and Their Applications • Lesson 9.5 – Determinants and Cramer's Rule • Lesson 9.4 – Multiplicative Inverses of Matrices and Matrix Equations	Representing relationships with matrices – Khan Academy Cramer's Rule – Khan Academy Zero and identity matrices – Khan Academy Multiplying a matrix by a vector – Khan Academy
	9 3/2 – 3/6	• Chapter 9 – Matrices and Determinants • Lesson 9.4 – Multiplicative Inverses of Matrices and Matrix Equations	Zero and identity matrices – Khan Academy Multiplying a matrix by a vector – Khan Academy
	10 3/9 – 3/12	Chapter 2 – Functions and Graphs • Lesson 2.8 – Distance and Midpoint Formulas; Circles Chapter 10 – Conic Sections and Analytic Geometry • Lesson 10.1 – The Ellipse	Distance formula – Khan Academy Midpoint formula – Khan Academy Ellipses – Khan Academy

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Advanced Topics Mathematics   2019-2020

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Quarter 4 Mar 23 – May 27	**1** 3/16 – 3/20	• **SPRING BREAK – NO SCHOOL**	
	2 3/23 – 3/27	Chapter 10 – Conic Sections and Analytic Geometry • Lesson 10.1 – The Ellipse • Lesson 10.2 – The Hyperbola	Ellipses – Khan Academy Hyperbolas – Khan Academy
	3 3/30 – 4/3	Chapter 10 – Conic Sections and Analytic Geometry • Lesson 10.3 – The Parabola • Topic - Cavalieri's Principle	Parabolas – Khan Academy Cavalieri's Principle – Khan Academy Cavalieri's Principle - YouTube
	4 4/6 – 4/9	Chapter 11 – Sequences, Induction, and Probability • Lesson 11.1 – Sequences and Summation Notation • Lesson 11.2 – Arithmetic Sequences • Holiday 4/10	Sequences and Series – Khan Academy Arithmetic sequences – Khan Academy
	5 4/14 – 4/17	Holiday 4/13 Chapter 11 – Sequences, Induction, and Probability • Lesson 11.2 – Arithmetic Sequences • Lesson 11.3 – Geometric Sequences and Series	Arithmetic sequences – Khan Academy Geometric series – Khan Academy
	6 4/20 – 4/24	Chapter 11 – Sequences, Induction, and Probability • Lesson 11.6 – Counting Principles, Permutations, and Combinations • Lesson 11.7 – Probability	Combinations and Permutations – Khan Academy Dependent – Khan Academy Categorical data – Khan Academy Adding probabilities – Khan Academy
	7 4/27 – 5/1	Chapter 11 – Sequences, Induction, and Probability • Lesson 11.7 – Probability	Dependent – Khan Academy Categorical data – Khan Academy Adding probabilities – Khan Academy
	8 5/4 – 5/8	• Topic - Random Variables	
	9 5/11 – 5/15	• Standards Based Performance Tasks	
	10 5/18 – 5/22	• Standards Based Performance Tasks	
	11 5/25 – 5/27	• Final Exams	

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