

AP Pre-Calculus Syllabus

Marking Period 1

Unit 1A – Linear, Quadratic and Polynomial Functions (Test 1.1 to 1.6)

Section	Title	2023 NJSLs for Mathematics
1.1	Change in Tandem	F-IF.A.1, F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.B.6
1.2	Rates of Change	F-IF.A.1, F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.B.6
1.3	Rates of Change in Linear and Quadratic Functions	F-IF.A.1, F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.B.6
1.4	Polynomial Functions and Rates of Change	F-IF.A.1, F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.B.6
1.5	Polynomial Functions and Complex Zeros	A-APR.B.3 F-IF.A.1, F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.B.6, F-IF.C.7c
1.6	Polynomial Functions and End Behavior	A-APR.B.3 F-IF.A.1, F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.B.6, F-IF.C.7c

Unit 1B – Rational Functions (Test 1.7 to 1.11)

Section	Title	2023 NJSLs for Mathematics
1.7	Rational Functions and End Behavior	A-APR.D.6 A-REI.A.2 F-BF.A.1 F-IF.B.4, F-IF.C.7.d, F-IF.C.8
1.8	Rational Functions and Zeros	A-APR.D.6 A-REI.A.2 F-BF.A.1 F-IF.B.4, F-IF.C.7.d, F-IF.C.8
1.9	Rational Functions and Vertical Asymptotes	A-APR.D.6 A-REI.A.2 F-BF.A.1 F-IF.B.4, F-IF.C.7.d, F-IF.C.8
1.10	Rational Functions and Holes	A-APR.D.6 A-REI.A.2 F-BF.A.1 F-IF.B.4, F-IF.C.7.d, F-IF.C.8
1.11	Equivalent Representations of Polynomial and Rational Expressions	A-APR.C.5, A-APR.D.6 A-REI.A.2 F-BF.A.1 F-IF.B.4, F-IF.C.7.d, F-IF.C.8

Unit 1C – Transformations and Modeling (Test 1.12 to 1.14)

Section	Title	2023 NJSLs for Mathematics
1.12	Transformations of Functions	F-BF.A.1, F-BF.B.3 F-IF.B.4 F-LE.A.2, F-LE.B.5
1.13	Function Model Selection and Assumption Articulation	F-BF.A.1, F-BF.B.3 F-IF.B.4 F-LE.A.2, F-LE.B.5
1.14	Function Model Construction and Application	F-BF.A.1, F-BF.B.3 F-IF.B.4 F-LE.A.2, F-LE.B.5

Marking Period 2

Unit 2A - Exponential Functions (Test 2.1 to 2.5)

Section	Title	2023 NJSLs for Mathematics
2.1	Change in Arithmetic and Geometric Sequences	A-SSE.B.3.c, A-SSE.B.4 F-BF.A.1, F-BF.A.2 F-IF.A.3, F-IF.B.4, F-IF.C.9 F-LE.A.1.b
2.2	Change in Linear and Exponential Functions	A-SSE.B.3.c F-BF.B.3 F-IF.C.8.b, F-IF.C.9 F-LE.A.1.a, F-LE.A.1.c, F-LE.A.2, F-LE.B.5
2.3	Exponential Functions	A-SSE.B.3.c F-IF.C.8.b F-LE.A.1.a, F-LE.A.2, F-LE.B.5
2.4	Exponential Function Manipulation	A-SSE.B.3.c F-BF.A.1.a, F-BF.A.1.b, F-BF.A.1.c, F-BF.A.2 F-IF.C.8.b F-LE.A.1.a, F-LE.A.1.c, F-LE.A.2, F-LE.B.5
2.5	Exponential Function Context and Data Modeling	A-SSE.B.3.c F-IF.C.8.b F-LE.A.1.a, F-LE.A.1.c, F-LE.A.2

Unit 2B - Function Validation (Test 2.6 to 2.8)

Section	Title	2023 NJSLs for Mathematics
2.6	Competing Function Model Validation	A-SSE.B.3 F-BF.A.1.c F-LE.A.1.a, F-LE.A.1.b, F-LE.A.1.c, F-LE.A.2
2.7	Composition of Functions	F-BF.A.1.c F-IF.B.4, F-IF.C.9
2.8	Inverse Functions	F-BF.B.4.b, F-BF.B.4.c, F-BF.B.4.d F-IF.B.4 F-LE.A.2, F-LE.B.5

Unit 2C – Exponential and Logarithmic Functions (Test 2.9 to 2.15)

Section	Title	2023 NJSLS for Mathematics
2.9	Logarithmic Expressions	A-REI.D.11 F-BF.B.5 F-IF.C.7.e F-LE.A.4
2.10	Inverses of Exponential Functions	A-REI.D.11 F-BF.B.5 F-IF.C.7.e F-LE.A.2, F-LE.A.4, F-LE.B.5
2.11	Logarithmic Functions	A-REI.D.11 F-BF.B.5 F-IF.C.7.e F-LE.A.4
2.12	Logarithmic Function Manipulation	A-REI.D.11 A-SSE.B.3 F-BF.A.1, F-BF.B.5 F-IF.C.7.e F-LE.A.4
2.13	Exponential and Logarithmic Equations and Inequalities	A-REI.D.11 A-SSE.B.3 F-BF.A.1, F-BF.B.5 F-IF.C.7.e F-LE.A.2, F-LE.A.4, F-LE.B.5
2.14	Logarithmic Function Context and Data Modeling	A-REI.D.11 A-SSE.B.3 F-BF.A.1, F-BF.B.5 F-IF.C.7.e F-LE.A.2, F-LE.A.4, F-LE.B.5
2.15	Semi-Log Plots	A-REI.D.11 A-SSE.B.3 F-BF.B.5 F-IF.C.7.e F-LE.A.2, F-LE.A.4, F-LE.B.5

Marking Period 3

Unit 3A - Periodic Trigonometric Functions (Test 3.1 to 3.8)

Section	Title	2023 NJSLS for Mathematics
3.1	Periodic Phenomena	F-BF.B.3, F-TF.A.1, F-TF.A.2, F-TF.A.3, F-TF.B.5
3.2	Sine, Cosine, and Tangent	F-TF.A.1, F-TF.A.2, F-TF.A.3, F-TF.B.5
3.3	Sine and Cosine Function Values	F-TF.A.1, F-TF.A.2, F-TF.A.3, F-TF.B.5
3.4	Sine and Cosine Function Graphs	F-BF.B.3, F-TF.A.2, F-TF.A.3, F-TF.B.5
3.5	Sinusoidal Functions	F-BF.B.3, F-TF.A.2, F-TF.A.3, F-TF.B.5
3.6	Sinusoidal Function Transformations	F-BF.B.5 F-TF.A.3, F-TF.A.2, F-TF.B.3,
3.7	Sinusoidal Function Context and Data Modeling	N-Q.A.1, F-BF.B.3
3.8	The Tangent Function	F-TF.A.1, F-TF.A.2, F-TF.A.3, F-TF.B.5

Unit 3B - Other Trigonometric Functions (Test 3.9 to 3.12)

Section	Title	2023 NJSLS for Mathematics
3.9	Inverse Trigonometric Functions	F-TF.A.1, F-TF.A.2, F-TF.A.3, F-TF.C.8, F-TF.C.9
3.10	Trigonometric Equations and Inequalities	F-TF.A.1, F-TF.A.2, F-TF.A.3
3.11	The Secant, Cosecant, and Cotangent Functions	F-TF.A.1, F-TF.A.2, F-TF.A.3, F-TF.B.5, F-TF.B.6, F-TF.B.7
3.12	Equivalent Representations of Trigonometric Functions	N.Q.A.1, F-TF.A.1, F-TF.A.2

Unit 3C - Polar Functions (Test 3.13 to 3.15)

Section	Title	2023 NJSLS for Mathematics
3.13	Trigonometry and Polar Coordinates	N-CN.B.4 F-TF.B.5, F-TF.C.8, F-TF.C.9
3.14	Polar Function Graphs	N-CN.B.4 F-TF.B.5, F-TF.C.8, F-TF.C.9
3.15	Rates of Change in Polar Functions	N-CN.B.4 F-TF.B.5, F-TF.C.8, F-TF.C.9

Marking Period 4

Unit 4A - Cumulative Review of Units 1, 2 and 3

Section	Title	2023 NJSLs for Mathematics
Unit 1	Polynomial and Rational Functions	A-APR.B.3, A-APR.C.5 A-APR.D.6 A-REI.A.2 F-BF.A.1, F-BF.B.3, F-BF.B.4.b, F-BF.B.4.c, F-BF.B.4.d F-IF.A.1, F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.B.6, F-IF.C.7c, F-IF.C.7d, F-IF.C.8 F-LE.A.2, F-LE.B.5
Unit 2	Exponential and Logarithmic Functions	A-REI.D.11 A-SSE.B.3.c, A-SSE.B.4 F-BF.A.1.c, F-BF.A.2, F-BF.B.3, F-BF.B.4.b, F-BF.B.4.c, F-BF.B.4.d F-IF.A.3, F-IF.B.4, F-IF.C.7.d, F-IF.C.7.e, F-IF.C.8, F-IF.C.9 F-LE.A.1.a, F-LE.A.1.b, F-LE.A.1.c, F-LE.A.2, F-LE.B.5
Unit 3	Trigonometric and Polar Functions	N-CN.B4 N-Q.A.1 F-BF.B.3 F-TF.A.1, F-TF.A.2, F-TF.A.3, F-TF.B.5, F-TF.B.6, F-TF.B.7, F-TF.C.8, F-TF.C.9

Unit 4B – Conic Sections (Test 4.6 to 4.7)

Section	Title	2023 NJSLs for Mathematics
4.6	Conic Sections	G-GPE.A.1, G-GPE.A.2, G-GPE.A.3 F-IF.B.4
4.7	Parametrization of Implicitly Defined Functions	G-GPE.A.1, G-GPE.A.2, G-GPE.A.3 F-IF.B.4

Unit 4C - Parametric Functions (Test 4.1 to 4.5)

Section	Title	2023 NJSLS for Mathematics
4.1	Parametric Functions	F-IF.B.4 F-BF.A.1
4.2	Parametric Functions Modeling Planar Motion	G-CO.B.6 F-IF.B.4 F-TF.A.2
4.3	Parametric Functions and Rates of Change	G-CO.B.6 F-IF.B.4 F-TF.A.2
4.4	Parametrically Defined Circles and Lines	G-CO.B.6 F-IF.B.4 F-TF.A.2
4.5	Implicitly Defined Functions	G-CO.B.6 F-IF.B.4 F-TF.A.2

Course Expectations and Skills

- Students are required to have proficiency in all prerequisite topics for AP Pre-Calculus. Those who do not demonstrate proficiency will be required to seek additional help to close their achievement gap in order to be successful in this course.
- Students are required to take notes and maintain those notes in a neat and organized notebook.
- Students are required to have a TI-84 Plus graphing calculator.
- Students are required to participate in both small and large group discussions and activities, as directed.

Resources

Text Book: *Pre-Calculus with Limits: A Graphing Approach*
Web Assign

Supplemental Materials: AP Central
Flippedmath.com

Assessment Information

Department of Mathematics - AP Pre-Calculus

Marking Periods 1 - 4	
Category	Percentage
Major	60%
Minor	30%
Homework	10%