

# Calculus SYLLABUS

## 1<sup>st</sup> Marking Period

### Test (Ch. P, Review Packet)

Section	Title	2023 NJSLs for Mathematics
P1 - P2	Graphs and Models	A-APR.B.3, A-CED.A.2, A-SSE.A.1a, F-IF.B.4, F-IF.C.7a, F-IF.C.7b, F-IF.C.7c, F-IF.C.8a, G-GPE.B.5
P3	Functions and Their Graphs	F-BF.A.1b, F-BF.A.1c F-BF.B.3, F-IF.A.1, F-IF.A.2, F-IF.B.4
P4 - P5	Inverse, Exponential, and Logarithmic Functions	N-RN.A.2, F-BF.B.3, F-BF.B.4a, F-BF.B.4b, F-IF.C.7e, F-LE.A.4, F-LE.B.5
Review	Trigonometry, Trig Functions, and their Inverses	G-SRT.C.6, G-SRT.C.7, G-SRT.C.8, F-IF.C.7f, F-TF.A.3

### Test (Ch. 1)

Section	Title	2023 NJSLs for Mathematics
1.1	A Preview of Calculus	A-SSE.A.2, F-IF.B.6,
1.2	Finding Limits Graphically and Numerically	A-APR.D.7, F-IF.A.2, F-IF.B.5, F-IF.C.8a
1.3	Evaluating Limits Analytically	A-APR.D.7, F-IF.A.2, F-IF.B.5, F-TF.A.3
1.4	Continuity and One-Sided Limits	F-IF.A.2, F-IF.B.4, F-IF.B.5, F-TF.A.3
1.5	Infinite Limits	F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.C.7b, F-IF.C.7d, F-IF.C.7f, F-TF.A.3
1.6	Limits at Infinity	F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.C.8a, F-TF.A.3
1.2, 1.3	Precise Definition of Limits (time permitting)	F-IF.A.2, F-IF.B.5, F-IF.C.8a, F-TF.A.3

**Test (Ch. 2.1 - 2.2)**

<b>Section</b>	<b>Title</b>	<b>2023 NJSL for Mathematics</b>
2.1	The Derivative and the Tangent Line Problem	A-CED.A.2, A-SSE.B.3a, F-IF.A.2, F-IF.B.6
2.2	Basic Rules of Differentiation and Rates of Change	N-RN.A.2, N-RN.A.3, A-CED.A.2 A-SSE.B.3a F-IF.B.6 F-TF.A.3 G-MG.A.2, G-MG.A.3

**2<sup>nd</sup> Marking Period****Test (Ch. 2.3-2.4)**

<b>Section</b>	<b>Title</b>	<b>2023 NJSL for Mathematics</b>
2.3	The Product and Quotient Rules and Higher Order Derivatives	N-RN.A., N-RN.A.3, N-Q.A.1 A-APR.C.5 A-CED.A.2 A-SSE.B.3a, F-IF.A.2, F-TF.A.3 G-MG.A.2, G-MG.A.3
2.4	The Chain Rule	N-RN.A.2, N-RN.A.3, A-APR.C.5 A-CED.A.2 A-SSE.B.3a, F-BF.A.1c, F-IF.A.2, F-TF.A.3

**Test (Ch. 2.5-2.6)**

<b>Section</b>	<b>Title</b>	<b>2023 NJSLs for Mathematics</b>
2.5	Implicit Differentiation	N-RN.A.2, N-RN.A.3, A-APR.C.5, A-CED.A.4, A-SSE.B.3a F-IF.A.2, F-TF.A.3
2.6	Derivatives of Inverse Functions	A-APR.C.5, A-CED.A.2, A-SSE.B.3a F-IF.A.1, F-IF.A.2, F-TF.A.3

**Test (Ch. 2.7-2.8)**

<b>Section</b>	<b>Title</b>	<b>2023 NJSLs for Mathematics</b>
2.7	Related Rates	N-RN.A.2, N-RN.A.3, N-Q.A.1, N-Q.A.2, A-CED.A.2, A-SSE.B.3a F-IF.A.2, F-IF.B.5, F-TF.A.3, F-TF.B.7 G-SRT.C.8 G-GMD.A.3, G-MG.A.3
2.8	Newton's Method (if time permits)	N-RN.A.1, N-RN.A.2, A-APR.B.3, A-SSE.B.3a, F-TF.A.3, G-MG.A.3

**Midterm (Ch. P, Ch. 1. Ch. 2)**

### 3<sup>rd</sup> Marking Period

#### Test (3.1, 3.3, 3.4 and 3.5)

Section	Title	2023 NJSL for Mathematics
3.1	Extrema on an Interval	A-SSE.B.3, F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.C.8a
3.3	Increasing and Decreasing Functions and First Derivative Test	A-APR.B.3 A-SSE.B.3, F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.C.8a
3.4	Concavity and Second Derivative Test	A-APR.B.3 A-SSE.B.3, F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.C.8a
3.5	A Summary of Curve Sketching-Graphing Functions	A-APR.B.3 A-SSE.B.3, F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.C.7a, F-IF.C.7b, F-IF.C.7c, F-IF.C.7d, F-IF.C.7e, F-IF.C.8a

#### Test (3.2 and 3.6)

Section	Title	2023 NJSL for Mathematics
3.2	Rolle's Theorem and Mean Value Theorem	A-APR.B.3 A-SSE.B.3, F-IF.A.2, F-IF.B.4, F-IF.B.5, F-IF.B.6, F-IF.C.8a
3.6	Optimization Problems	N-Q.A.1, N-Q.A.2, A-APR.B.3 A-CED.A.2, A-CED.A.4 A-SSE.B.3 F-IF.A.2, F-IF.B.5, F-IF.C.8a G-GMD.A.3, G-MG.A.3 G-SRT.C.8

#### Test (3.7 and 7.7)

Section	Title	2023 NJSL for Mathematics
3.7	Linear Approximation and Differentials	A-CED.A.2 A-SSE.3a, F-IF.A.2 G-MG.A.1
7.7	Indeterminate Forms and L'Hopital's Rule	A-APR.A.1 A-SSE.3a F-IF.A.2, F-IF.B.4

***4<sup>th</sup> Marking Period***

**Test (4.1-4.3)**

<b>Section</b>	<b>Title</b>	<b>2023 NJSLs for Mathematics</b>
4.1	Antiderivatives	N-RN.A.2, N-RN.A.3, N-Q.A.2 A-CED.A.1 F-IF.A.2 F-TF.A.3
4.2	Area-Approximating areas under the Curve	A-SSE.B.4 F-IF.A.2, F-IF.A.3, F-IF.C.7c G-MG.A.2, G-MG.A.3
4.3	Riemann Sums and Definite Integrals	N-RN.A.2, N-RN.A.3 F-IF.A.2, F-TF.A.3 G-MG.A.2, G-MG.A.3

**Test (4.4 and 4.6)**

<b>Section</b>	<b>Title</b>	<b>2023 NJSLs for Mathematics</b>
4.4	Fundamental Theorem of Calculus *Include Mean Value Theorem for Integrals and Average Value of a Function	N-RN.A.2, N-RN.A.3, A-SSE.B.3a F-IF.A.2, F-IF.B.4, F-IF.C.7c, F-IF.C.8a F-TF.A.3
4.6	Integration by Substitution	N-RN.A.2, N-RN.A.3, A-CED.A.1, A-CED.A.4 A-SSE.B.3a F-IF.A.2, F-IF.B.4, F-IF.C.7c, F-IF.C.8a F-TF.A.3

## Test (4.7 and 6.1)

Section	Title	2023 NJSL for Mathematics
4.7	The Natural Logarithm of Functions: Integration	N-RN.A.2, N-RN.A.3, A.CED.A.1, A-SSE.B.3a F-IF.C.8b F-LE.A.1c, F-LE.A.2, F-LE.A.4 F-TF.A.3
6.1	Area of Region Between Two Curves	N-RN.A.2, N-RN.A.3, A-CED.A.1 A-SSE.B.3a, F-IF.A.2, F-IF.B.4, F-IF.C.7c, FIF.C.8a

## Cumulative Final Exam (Ch. P – 4, 6.1)

### Course Expectations and Skills

- Students are required to have proficiency in all prerequisite topics for Calculus. Those who do not demonstrate proficiency will be required to seek additional help after school 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 to bring their Chrome Book charged and ready to use for the lesson.
- Students are encouraged to have a graphing calculator.
- Students are required to participate in both small and large group discussions and activities, as directed

## Resources

Text Book: Calculus for AP 2<sup>nd</sup> Edition, Ron Larson and Paul Battaglia

Additional Resources:

- WebAssign
- CalcChat.com
- CalcView.com
- Desmos and Desmos Teacher Activities

### **Grading Policy** Department of Mathematics

Marking Periods 1 - 4	
Category	Percentage
Major	55%
Minor	35%
Homework	10%