Paramount Unified School District

Educational Services

Precalculus Honors
Year at a Glance

2017-2018

Precalculus Honors – Scope and Sequence

Fall Semester						Spring Semester			
Topic 1 16 Days	**Topic 2 18 Days**	**Topic 3 12 Days**	**Topic 4 14 Days**	**Topic 5 14 Days**	**Additional Topic**	**Topic 6 19 Days**	**Topic 7 14 Days**	**Topic 8 14 Days**	**Topic 9 20 Days**
Functions and Graphs	**Polynomial and Rational Functions**	**Exponential and Logarithmic Functions**	**Systems of Equations and Inequalities**	**Sequences, Inductions, and Probability**	**Conic Sections**	**Trigonometric Functions**	**Analytic Trigonometry**	**Additional Topics in Trigonometry**	**Introduction to Calculus**
A-Rei 10, 11	F-IF 4, 5	F-IF 4	A-REI 12	F-IF 3	A-CED 1,2	F-TF 1	F-TF 9	G-SRT 10	Calc. 1.0
F-IF 1,2	A-APR 1,2,3	F-BF 1, 1b	A-CED 2	A-APR 5	A-CED 3,4	F-TF 2, 2.1	F-TF 10	G-SRT 11	Calc. 2.0
F-IF 4,5,6	A-APR 6	A-SSE 1b, 1c	A-CED 3	F-BF 2	G-GPE 1	F-TF 3		N-VM 1	Calc. 4.0
F-IF 7,8,9	F-IF 7	A-CED 2	A-REI 6	S-MD 3	G-GPE 2	F-TF 4		N-VM 2	
A-CED 1,2	A-CED 1,3	F-IF 7, 7e	A-REI 7	S-CP 2, 3	G-GPE 3.1	F-TF 6		N-VM 3	
A-SSE 3	F-BF 3	F-IF 8, 9	N-VM 6, 10	S-CP 6		F-TF 7		N-VM 4	
N-Q 1	N-CN 1,2	F-LE 4, 4.1		S-CP 9				N-VM 5	
F-BF 3, 4	N-CN 7	F-LE 4.2, 4.3							
	N-CN 3 (+)	F-BF 4							

Major Clusters

Algebra - Seeing Structure in Expressions (A-SSE)
- Interpret the structure of expressions.
- Write expressions in equivalent forms to solve problems.

Algebra - Arithmetic with Polynomials and Rational Expressions (A-APR)
- Perform arithmetic operations on polynomials.
- Understand the relationship between zeros and factors of polynomials.

Algebra - Reasoning with Equations and Inequalities (A-REI)
- Understand solving equations as a process of reasoning and explain the reasoning
- Represent and solve equations and inequalities graphically

Functions –Interpreting Functions (F-IF)
- Interpret functions that arise in applications in terms of the context.

Functions –Building Functions (F-BF)
- Build a function that models a relationship between two quantities.

Statistics and Probability – Making Inferences and Justifying Conclusions (S-IC)
- Make inferences and justify conclusions from sample surveys, experiments, and observational studies.

Supporting Clusters

Algebra - Arithmetic with Polynomials and Rational Expressions (A-APR)
- Rewrite rational expressions.

Algebra - Creating Equations (A-CED)
- Create equations that describe numbers or relationships.

Algebra - Reasoning with Equations and Inequalities (A-REI)
- Solve equations and inequalities in one variable

Functions –Interpreting Functions (F-IF)
- Analyze functions using different representations.

Functions –Linear, Quadratic, and Exponential Models (F-LE)
- Construct and compare linear, quadratic, and exponential models and solve problems.

Statistics and Probability – Interpreting Categorical and Quantitative Data (S-ID)
- Summarize, represent, and interpret data on a single count or measurement variable.

Statistics and Probability – Making Inferences and Justifying Conclusions (S-IC)
- Understand and evaluate random processes underlying statistical experiments.

Additional Clusters

Number and Quantity - The Complex Number System (N-CN)
- Perform arithmetic operations with complex numbers.
- Use complex numbers in polynomial identities and equations.

Algebra - Arithmetic with Polynomials and Rational Expressions (A-APR)
- Use polynomial identities to solve problems.

Functions –Building Functions (F-BF)
- Build new functions from exiting functions.

Functions – Trigonometric Functions (F-TF)
- Extend the domain of trigonometric functions using the unit circle.
- Model periodic phenomena with trigonometric functions.
- Prove and apply trigonometric identities.

Geometry – Expressing Geometric Properties with Equations (G-GPE)
- Translate between the geometric description and the equation for a conic section.

Statistics and Probability – Using Probability to Make Decisions (S-MD)
- Use probability to evaluate outcomes of decisions.

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Summary of Year for Precalculus Mathematics

In this Precalculus Course, students have three fundamental goals: 1) acquire a solid foundation in algebra and trigonometry, preparing them for other courses such as calculus, business calculus, and finite mathematics, 2) engage in opportunities to model and solve authentic real-world problems that require algebra and trigonometry, and 3) develop problem-solving skills, while fostering critical thinking, within an interesting mathematical setting. In this course students will review equations, linear inequalities, absolute value inequalities, and functions. They will construct functions from verbal descriptions and formulas (that extends work done in Algebra 2) and apply modeling skills to situations that students are likely to see in calculus when solving applied problems involving maximum or minimum values. Students will also develop their trigonometry skills from the perspective of the unit circle, rather than using right triangles as in Algebra 2. Furthermore, many of the liberal arts applications in the Algebra 2 course are replaced by more scientific or higher level applications in Precalculus.

Precalculus Honors moves at an accelerated pace, allowing for additional instructional weeks at the end of the course for teachers to prepare students for Calculus topics.

Standards for Mathematical Practice	Fluency Requirements for Precalculus
Throughout Precalculus, students should continue to develop proficiency with the Common Core's eight Standards for Mathematical Practice: 1. Make sense of complex problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.	**A-SSE 2** See structure in expressions and use this structure to rewrite expressions and solve equations. **A-APR 6** Divide polynomials with remainder by inspection in simple cases. **F-IF 3** Fluency in translating between recursive definitions and closed forms.

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Topic	**Content**	**Textbook Lessons**	**Start Date**	**Assessment Dates**	**# of Days**
1	**Functions and Graphs**	P.1, P.3, P.5, P.6, P.9, 1.1 – 1.8	August 17, 2017	**September 7-8, 2017**	16
2	**Polynomial and Rational Functions**	2.1 – 2.7	September 11, 2017	**October 3-4, 2017**	18
3	**Exponential and Logarithmic Functions**	3.1 – 3.5	October 5, 2017	**October 19-20, 2017**	12
4	**Systems of Equations and Inequalities**	7.1, 7.2, 8.2, 7.4 – 7.6	October 23, 2017	**November 8-9, 2017**	14
5	**Sequences, Induction, and Probability**	10.1 – 10.3, 10.5 – 10.7	November 13, 2017	**December 6-7, 2017**	14
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6	**Trigonometric Functions**	4.1 – 4.8	January 22, 2018	**February 16-17, 2018**	19
7	**Analytic Trigonometry**	5.1 – 5.3, 5.5	February 20, 2018	**March 8-9, 2018**	14
8	**Additional Topics in Trigonometry**	6.1, 6.2, 6.5 – 6.7	March 12, 2018	**March 28-29, 2018**	14
9	**Introduction to Calculus**	11.1 – 11.4	April 9, 2018	**May 3-4, 2018**	20
			Total # of Instructional Days		**147**