

Advanced Placement (AP) Precalculus

Grade 11-12 Math

Full-Year Course

Course Description

AP Precalculus is designed to be the equivalent of a first semester college precalculus course. AP Precalculus provides students with an understanding of the concepts of college algebra, trigonometry, and additional topics that prepare students for further college level mathematics courses. This course explores a variety of function types and their applications—polynomial, rational, exponential, logarithmic, trigonometric, polar, parametric, vector-valued, implicitly defined, and linear transformation functions using matrices. Throughout the course, the mathematical practices of procedural and symbolic fluency, multiple representations, and communication and reasoning are developed. Students experience the concepts and skills related to each function type through the lenses of modeling and covariation and engage each function type through their graphical, numerical, analytical, and verbal representations.

Students who take the AP Precalculus exam and earn a score of 3, 4 or 5 will earn college math credit at all Illinois public colleges and universities.

Essential Standards

- Analyze rates of change
- Learn polynomial functions and their characteristics
- Learn rational functions and their characteristics
- Understand function transformations
- Construct function models for different applications
- Understand arithmetic and geometric sequences and their connections to linear and exponential functions
- Analyze exponential functions and their properties and applications
- Understand logarithmic functions and their properties and applications
- Understand function composition and inverse functions
- Solve exponential and logarithmic equations and inequalities
- Model periodic phenomena
- Graph trigonometric functions and their transformations
- Understand key features of all trigonometric and inverse trigonometric functions
- Solve trigonometric equations and inequalities
- Understand applications of sinusoidal functions
- Understand polar coordinates and graphs of polar functions
- Use parametric functions to model planar motion
- Define functions and conic sections
- Understand and learn different the applications of vectors and matrices