AP Precalculus

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TO REGISTER: **https://xumath.org**

WHEN, WHERE, HOW MUCH?

Term: June 3– Aug. 11, 2025
In-Person and Live Zoom Lecture: Tue. & Sat. 7-9pm CT
Recitation Video: Available on Canvas on Thu. & Mon.
In-Person Address: QD Academy, 4100 Legacy Drive, Suite 404, Plano, TX 75024
or 4116 W Spring Creek Parkway, Suite 500, Plano, TX 75024
Format:

- 20 2-hour lectures + 20 1-hour recitation videos
- 20 homework assignments (to be graded) + 2 exams (to be graded)
- A student can request the video of a class if the student has to miss the class.

Tuition: $960 (if register and pay by March 15), $990 (after March 15)

WHO TEACHES?

Dr. Sheng Xu: Associate professor of math at Southern Methodist University

- Ph.D. from Cornell and post-doc at Princeton and Cornell
- 17 years and 15 math courses teaching experience
- Betty McKnight Spears Endowed Teaching Excellence Award in Math
- Recommendation by K-12 students and parents in anonymous testimonials on https://xumath.org/testimonial/
- Author of an undergraduate textbook *Introduction to Scientific Computing with Matlab and Python Tutorials*, Taylor Francis

COURSE INFO

Syllabus, Sample Notes and Videos: **https://xumath.org**
Required Textbook:

- **[1]** Customized notes by Prof. Xu (available before each class)
- **[1]** Ron Larson et al., *Precalculus With Limits: A Graphing Approach (Advanced Placement Version)*, 4th Edition, ISBN 0-6183-9480-X

References:

- **[2]** E.W. Swokowski & J.A. Cole, *Precalculus Functions and Graphs*, Edition 12e, 0-8400-6892-1
- **[3]** R. Rusczyk, *Art of Problem Solving: Precalculus*, 2nd Edition
- **[4]** R. Rusczyk and M. Crawford, *Art of Problem Solving: Intermediate Algebra*

TOPICS

	Main Topics
1	Coordinate systems; Graphs of equations
2	Functions: definition, graphs, operations
3	Quadratic functions; Polynomial functions; Polynomial Divisions
4	Zeros of polynomials; Rational Functions
5	Inverse function; Exponential and logarithmic functions; Laws of exponents and logarithms
6	Exponential and logarithmic equations; Gaussian elimination for systems of linear equations
7	Systems of nonlinear equations; Partial fractions
8	Angles; Trigonometric functions of angles
9	Trigonometric functions: graphs and properties
10	Inverse trigonometric functions; Application of trigonometric functions
11	Trigonometric identities and equations
12	Trigonometric formulas and applications: Addition, subtraction
13	Trigonometric formulas: multiple-angle; product-to-sum; sum-to-product
14	Laws of sines and cosines
15	Vectors; Dot product; De Moivre’s theorem
16	Parabolas; Ellipses; Hyperbolas
17	Plane curves; Parametric equations; Polar coordinates
18	Polar equations of conics
19	Series; Mathematical induction
20	Binomial theorem; Permutations and combinations