San Antonio Math Include

Provide Greater Access to STEM Education to All Students

2022-2023 Free Online Courses Curriculum

September 24 to November 13, 2022 and January 7 to February 19, 2023

Website: mathinclude.org | Email: sanantoniomathinclude@gmail.com

K-8 Math Classes (by grade level)

Every class has a 20-student limit. These who sign up after the 20-student limit will be automatically waitlisted.

Semester	Week	Date	Tadpoles (K-1)	Whirlpool (2-3)	Andromeda (4-5)	Triangulum (6-8)	MAA Pre-AMC (5-8)	MAA AMC 8 (6-8)
Fall 2022	1	9/24-25	Addition	Strategies	Factor	Four Operations	AMC 8 Worksheet	Counting
	2	10/1-2	Subtraction	Rearranging	Prime and Composite	Solving by Assuming	AMC 8 Worksheet	Counting
	3	10/9-9	Skip Counting	Crosstiles	Divisibility and Remainder	Looking for a Pattern	AMC 8 Worksheet	Counting
	4	10/15-16	Time	Cancelling	Divisibility by 9 and 3	Working Backward	AMC 8 Worksheet	Probability
	5	10/22-23	Even and Odd	All at Once	Prime Factorization	Sequence	AMC 8 Worksheet	Probability
	6	10/29-30	Rounding	Equation Paths	Pyramid Descent	Prime	AMC 8 Worksheet	Probability
	7	11/5-6	Fact Families	Parentheses	Divisibility with Factorization	Divisibility	AMC 8 Worksheet	Probability
	8	11/12-13	Patterns	Skip Counting	Nim	Logic	AMC 8 Worksheet	Number Theory
Spring 2023	9	1/7-8	Number Lines	Challenge Problems	Challenge Problems	Simple Equations	AMC 8 Worksheet	Number Theory
	10	1/14-15	Money	Twos and Half	Fraction	Remainder	AMC 8 Worksheet	Number Theory
	11	1/21-22	Integers	Addition and Subtraction	Mixed Numbers	Average Problems	AMC 8 Worksheet	Number Theory
	12	1/28-29	Place Value	Morehan Two Numbers	Skip Counting	Area	AMC 8 Worksheet	Geometry
	13	2/4-5	Factions	8's and 9's	Addition and Subtraction	Fractions	AMC 8 Worksheet	Geometry
	14	2/11-12	Geometry	Inside or Outside	Constellation Puzzles	Square	AMC 8 Worksheet	Geometry
	15	2/18-19	Multiplication	Checker Board Paths	Mixed Number Arithmetic	Angles and Triangles	AMC 8 Worksheet	Geometry

*MAA Pre-AMC and MAA AMC 8 are both competitive math classes designed to prepare students for the American Mathematics Competitions (AMC) series. MAA Pre-AMC focuses on the first 15 questions in AMC 8 and MAA AMC 8 focuses on the last 10 questions. Our other middle school math class, Triangulum, is focused on developing problem solving skills.

9-12 Math Classes (by grade level)

Every class has a 20-student limit. These who sign up after the 20-student limit will be automatically waitlisted.

Semester	Week	Date	Calculus AB (8-12)	AP Calculus AB Practice* (9-12)	SAT Math (8-12)
Fall 2022	1	9/24-25	Continuity and left/right hand limits	AP Calculus AB Free-Response Questions Worksheet	Exponents & Radicals
	2	10/1-2	Trigonometric Functions and Limits	AP Calculus AB FRQ Worksheet	Percent
	3	10/9-9	Derivatives	AP Calculus AB FRQ Worksheet	Exponential vs. Linear Growth
	4	10/15-16	Equations of a Tangent Line and Higher Order Derivatives	AP Calculus AB FRQ Worksheet	Rates
	5	10/22-23	Antiderivatives and Indefinite Integrals	AP Calculus AB FRQ Worksheet	Ratio & Proportion
	6	10/29-30	Implicit Differentiation and U-Substitution	AP Calculus AB FRQ Worksheet	Expressions
	7	11/5-6	More Integrals	AP Calculus AB FRQ Worksheet	Constructing Models
	8	11/12-13	Area Under a Curve—Left, Right, and Midpoint Sums	AP Calculus AB FRQ Worksheet	Manipulating & Solving Equations
Spring 2023	9	1/7-8	Chain Rule	AP Calculus AB FRQ Worksheet	More Equation Solving Strategies
	10	1/14-15	Maximums/Minimums (Critical Points), Points of Inflection, Concavity	AP Calculus AB FRQ Worksheet	Systems of Equations
	11	1/21-22	FTC and Definite Integrals	AP Calculus AB FRQ Worksheet	Inequalities
	12	1/28-29	U Substitution and Integration by Parts	AP Calculus AB FRQ Worksheet	Lines
	13	2/4-5	Solids of Revolutions	AP Calculus AB FRQ Worksheet	Interpreting Linear Models
	14	2/11-12	MVT and IVT and Rolle's Theorem	AP Calculus AB FRQ Worksheet	Functions
	15	2/18-19	AP Calculus BC Simple Study Review	AP Calculus AB FRQ Worksheet	Quadratics

* The prerequisite of AP Calculus AB Practice is Calculus AB or an equivalent.

Computer Science Classes (by grade level)

Every class has a 20-student limit. These who sign up after the 20-student limit will be automatically waitlisted.

Semester	Week	Date	Python for Kids* (3-5)	Java* (6-12)	C++* (6-12)	AP Computer Science A Practice* (9-12)
Fall 2022	1	9/24-25	Not All Snakes Slither	Hello World	Start C++	AP Computer Science A Free-Response Questions Worksheet
	2	10/1-2	Calculations and Variables	Input and Output	Statements	AP CSA FRQ Worksheet
	3	10/9-9	Strings, Lists, Tuples, and Maps	Functions and for Loops	Use Array	AP CSA FRQ Worksheet
	4	10/15-16	Drawing with Turtles	Operations	String	AP CSA FRQ Worksheet
	5	10/22-23	Asking Questions with if and else	Largest Number	Class and Object	AP CSA FRQ Worksheet
	6	10/29-30	Going Loopy	Fibonacci Series	Pointer and Reference	AP CSA FRQ Worksheet
	7	11/5-6	Functions and Modules	Areas	File Operation	AP CSA FRQ Worksheet
	8	11/12-13	Classes and Objects	for and while Loops	Static Exception Vector	AP CSA FRQ Worksheet
Spring 2023	9	1/7-8	Python's Built-in Functions	1-D and 2-D Arrays	Loops	AP CSA FRQ Worksheet
	10	1/14-15	Useful Python Modules	Converting to Binary	Perfect Numbers	AP CSA FRQ Worksheet
	11	1/21-22	More Turtle Graphics	File I/O	Prime Numbers	AP CSA FRQ Worksheet
	12	1/28-29	Using tkinter for Better Graphics	System Date and Time	Factorials	AP CSA FRQ Worksheet
	13	2/4-5	Bounce! – 1	File Operations	Class	AP CSA FRQ Worksheet
	14	2/11-12	Bounce! -2	Factorials	Power	AP CSA FRQ Worksheet
	15	2/18-19	Creating Graphics for the Mr. Stick Man Game	Search	Roman Number	AP CSA FRQ Worksheet

*The prerequisite of Python for Kids is a 15+ wpm (word per minute) typing speed. Students can test their typing speed at https://www.typingtest.com/. Students need to use their own computers in this class.

*The prerequisite of Java is a 30+ wpm (word per minute) typing speed. Students can test their typing speed at https://www.typingtest.com/. Students need to use their own computers in this class.

*The prerequisite of C++ is a 30+ wpm (word per minute) typing speed. Students can test their typing speed at https://www.typingtest.com/. Students need to use their own computers in this class.

*The prerequisite of AP Computer Science A Practice is Java, C++, or an equivalent. It is taught in Java.

Science Classes (by grade level)

Every class has a 20-student limit. These who sign up after the 20-student limit will be automatically waitlisted.

Semester	Week	Date	Biology* (6-12)	Chemistry* (6-12)	Physics* (6-12)
Fall 2022	1	9/24-25	The Science of Biology	Essential Ideas	Introduction to Physics
	2	10/1-2	Biological Macromolecules	Atoms, Molecules, and Ions	Position & Velocity and Graphical Analysis of Each
	3	10/9-9	Cell Structure	Composition of Substances and Solutions	Free Fall
	4	10/15-16	Structure and Function of Plasma Membranes	Stoichiometry of Chemical Reactions	Vectors
	5	10/22-23	Metabolism	Thermochemistry	More Vectors & 2D/3D Kinematics
	6	10/29-30	Cellular Respiration	Electronic Structure and Periodic Properties of Elements	Forces, Masses, & Accelerations; Newton's 2nd Law
	7	11/5-6	Photosynthesis	Chemical Bonding and Molecular Geometry	Newton's 3rd Law and Types of Forces
	8	11/12-13	Cell Communication	Advanced Theories of Covalent Bonding	Friction
Spring 2023	9	1/7-8	Cell Reproduction	Gases	Work & Work-Energy Theorem
	10	1/14-15	Meiosis and Sexual Reproduction	Liquids and Solids	Kinetic & Potential Energy
	11	1/21-22	Mendel's Experiments and Heredity	Solutions and Colloids	Conservation of Energy
	12	1/28-29	Modern Understanding of Inheritance	Kinetics	Linear Momentum
	13	2/4-5	DNA Structure and Function	Fundamental Equilibrium Concepts	Total Momentum & Intro to Collisions
	14	2/11-12	Genes and Proteins	Acid-Base Equilibria	Inelastic and Elastic Collisions
	15	2/18-19	Gene Expression	Equilibria of Other Reaction Classes	Rotational Motion

*The Biology class teaches high school level Honors Biology.

*The Chemistry class teaches high school level Honors Chemistry.

*The Physics class teaches high school level Honors Physics.