2010 Science, Technology, Engineering and Mathematics (STEM) 
Program 

Pre-Calculus 

Syllabus 

Pre-Calculus 

Program Duration: Six weeks, Class meets fifteen hrs/week, three elective High School credits 
Instructor: Prof. Dario Cardenas, Mathematic Department, CCNY 
TAs: Mr. Isaiah Yim 

Lesson  Objectives
1  Pre-test to gauge students’ educational background of subject material. 
Divide students into Calculus and Pre-Calculus session.
2  Algebra Review Notes 
Algebra Review Notes document will be provided.
3  Algebra Review Notes 
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4  Algebra Review Notes 
Algebra Review Notes document will be provided.
5  Algebra Review Notes 
Algebra Review Notes document will be provided.
6  Section: 1.1, 1.8 Real numbers and the x,y-coordinate plane 
Study of real numbers, properties of real numbers, and coordinate geometry.
7  Sec: 1.10, 2.2 Graph of lines and functions 
Graph of lines and functions.
8  Section: 1.7 Inequalities 
Study of inequalities.
9  Section: 3.1 Graphs of polynomials 
Study how to graph polynomials.
10 Review of the previous sections.
11 Exam # 1 (one hour) 
Review exam and make sure students understand the material (theory and applications).
12 Section: 6.1, 6.2 Trigonometry. Angle measure and Right Triangle Trigonometric 
Study of angle measure and trigonometry of right triangles.
13 Section: 6.3 Trigonometric functions of angles 
Study of trigonometric functions of angles.
14 Section: 2.4 Transformations of functions 
Trigonometric functions of angles (continuation) and transformations of functions.
15 Section: 5.3 Trigonometric Graphs 
Graph of trigonometric functions.
16 Section: 5.4, 7.1 Trigonometric Graphs and Elementary trigonometric identities 
More trigonometric graphs, and study of elementary trigonometric identities.
17 Section: 7.2, 7.3 Sum, difference, double and half angle formulas
Study of addition, subtraction, double-angle, and half-angle formulas.

Section: 2.8 Inverse Functions
Study of inverse functions.

Section: 7.4, 7.5 Inverse Trigonometric Functions and Trigonometric equations
Study of inverse trigonometric functions, and solve trigonometric equations.

Review about trigonometric functions of angles, right triangle trigonometric, inverse functions, and inverse trigonometric functions.

Exam # 2 (one hour)
Review the exam and make sure students understand the material (theory and applications).

Section: 2.3, 2.5 Average rate of change, Quadratic Functions
Study average rate of change, quadratic functions, maxima and minima.

Section: 2.6, 2.7 Modeling with Functions, Combining Functions
Find models that can be constructed using geometric or algebraic properties. Study different ways to combine functions to make new functions.

Section: 4.1, 4.5 Exponential Functions, Exponential Growth
Study exponential functions and graphs, and exponential models.

Section: 4.2, 4.5 Logarithmic Functions, Laws of Logarithms
Study the inverse of exponential functions and the properties of logarithms.

Review about average rate of change, quadratic functions, exponential functions, and logarithmic functions.

Exam # 3 (one hour)
Review the exam and make sure students understand the material (theory and applications).

Final Review

Final Review

Final Exam (2 hours).
Solve in detail final exam and make sure students understand the material (theory and applications).

TEXT  

Instructor: Dario Cardenas
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Grade computation:

Your class average is determined by:

Homework: 5%
Quizzes: 20%
In-class exams (3): 35%
Final Exam: 40%