2023

MATH 115: College Algebra for Pre-Calculus

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M115 – College Algebra for Pre-calculus

Queens College, Fall 2023

Class Number & Time: Section 11SK, class #25452, M/W 10:05 – 11:55 AM

Instructor: Seth Lehman

Email: seth.lehman@qc.cuny.edu

Room: Kiely Hall 313

Student Hours: 12:15 – 1:15 PM Mondays in Delaney 103 (or by appointment)

Learning Outcomes:

By the end of this course, students should:

1. Identify and distinguish between linear, rational, radical, and quadratic equations and expressions.
2. Articulate the difference between expressions and equations and apply appropriate techniques for simplifying expressions and solving equations.
3. Develop skill in factoring algebraic expressions and make sense of algebra procedures (such as finding a least common multiple or simplifying rational expressions) by considering factors.
4. Develop best practices for success in college math courses, including fostering a growth mindset and taking personal responsibility for learning.

This course also satisfies the Mathematical and Quantitative Reasoning (MQR) requirement of the Pathways General Education Required Core with the following learning outcomes:

- **MQR 1:** Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.
- **MQR 2:** Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.
- **MQR 3:** Represent quantitative problems expressed in natural language in a suitable mathematical format.
- **MQR 4:** Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.
- **MQR 5:** Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.
- **MQR 6:** Apply mathematical methods to problems in other fields of study.

Textbook:

Intermediate Algebra, 2nd edition by Marecek & Mathis. You don't need to have a physical copy of the textbook. It is available for free online. The textbook has very helpful practice problems and examples, so I recommend that you use it to supplement what you are learning in class.

Required Technology:

- An active Queens College email account & access to Blackboard
- A free MyOpenMath account (see Homework section below)

Attendance Policy and Participation:

Attending and participating in every class is crucial to success in this course, and participation makes up 5% of your final grade. If you miss a class, you have the responsibility to catch up on covered material, announcements, and quizzes. Over time, absence from classes will impact your grades and financial aid. Based on SEEK attendance policy, SEEK students may have no more than 4 absences from this class. In addition to attendance, some participation activities will be given in class or assigned through Blackboard. If you miss or are late in completing more than two of these or you frequently miss class, you will not receive full credit for participation.

Please silence and put away phones, earbuds, and other electronic devices during class. Laptops and tablets are permitted only for taking notes or for class activities. I expect full participation when you attend, so please don't spend your time surfing the web, listening to music, sleeping, or carrying on conversations unrelated to the class. You should expect to spend 3-4 hours a week completing assignments outside of class.

Homework:

Homework is not optional in this class, and practicing homework problems (on your own, without the help of the internet!) is key to your success in the course. Homework will be completed online using MyOpenMath, a free online homework system. Our Course ID is **181639**, and the class key is **qc25452**. You can watch this video for instructions on enrolling in the course. Once you are enrolled, you will find the content standards, homework assignments, links to the relevant sections of the textbooks, and supplemental videos. There will be 16 total assignments, plus an extra credit one at the end of the semester. Assignments will be due on Wednesdays or Fridays.

Quizzes and Exams:

The key concepts that you will learn in this class are summarized in a list of 15 standards at the end of the syllabus. Each standard will be tested with a short two-question quiz at some point during the semester and graded with a check-minus, check, or check-plus, based on completeness, accuracy, and evidence that you understand the material. You may choose to retake a different version of any standards quiz at any point during the semester (maximum of two retakes per week). This allows you an opportunity to learn from feedback and to improve your understanding of the specific standards that are difficult for you. The final letter grading for quizzes will be as follows:

A (95+/-)	*Check or check-plus on 14 or 15 of the 15 standards*
B (85+/-)	*Check or check-plus on 12 or 13 of the 15 standards*
C (75+/-)	*Check or check-plus on 10 or 11 of the 15 standards*
D (65+/-)	*Check or check-plus on 9 of the 15 standards*
F (55+/-)	*Fewer than 9 check or check-plus grades*

You will also take two in-class exams and one final exam reinforcing the corresponding standards. The exams may include multiple choice, true/false, and short answer questions. All exams are closed book/notes.

Exam 1	Standards 1 – 6	**Wednesday, October 4**
Exam 2	Standards 7 – 12	**Wednesday, November 15**
Final Exam	All Standards	**Week of December 14-20**

Course Grades:

Your grade will be made up of the following categories:

Participation:	5%
Homework:	15%
Standards Quizzes:	30%
In-Class Exams:	30%
Final Exam:	20%
Total……...100%	

Grades are computed using the standard scale:

97%, 93% and 90%	*for grades of A+, A and A-*
87%, 83%, and 80%	*for grades of B+, B, and B-*
77%, 73%, and 70%	*for grades of C+, C, and C-*
67% and 60%	*for grades of D+ and D*
Below 60%	*is an F*

Missed Assignments:

I understand that challenges can come up that can affect your ability to meet deadlines. You have been automatically granted 5 late passes in MyOpenMath that you can apply to extend a homework assignment by 48 hours (here is a video with instructions for applying late passes). If you miss a quiz given in class, you may choose to retake the standard with no penalty; however, the maximum of two retakes per week still applies (so you will not be able to wait until the end of the semester to retake many missed quizzes). If you miss an exam, I will need to see documentation of an emergency (doctor's note, proof of positive Covid test, etc.) before granting a makeup. You will receive a zero if you miss an exam without documentation.

Calculators:

Basic scientific or graphing calculators are permitted for use in the course, and I recommend bringing one for quizzes and exams. You will not be permitted to use a cell phone as a calculator. If you do not have a calculator and would like to borrow one for exams, they are available in the math office in Kiely Hall 243.

Help Outside of Class:

The math lab in Kiely Hall 331 offers limited drop-in tutoring for students in 100-level math classes: https://sites.google.com/view/qc-math-tutoring/home. You may also visit QC Learning Commons in Kiely 131 or SEEK tutoring in Delaney Hall 112 (if you are a SEEK student) for help. I encourage you to visit my office hours or email me to ask questions. I respond to emails within 24 hours during the work week.

Academic Honesty:

Your work in this class must be your own! Copying someone else's quiz or exam, using the internet or a cellphone during exams, or communicating with another student during exams are all examples of academic dishonesty. You may form study groups to collaborate on homework and assignments, but the work submitted must be yours individually. The CUNY Policy on Academic Integrity states that academic dishonesty is punishable by penalties including failing grades, suspension, and expulsion.

Accommodations for Students with Disabilities:

Students with disabilities needing academic accommodation should register with and provide documentation to the Office of Special Services. The Office of Special Services will provide a letter for you to show your instructor indicating the need for accommodation and the nature of it. This should be done during the first week of class.

Technical Support:

The ITS Help Desk provides technical support for students who need help with Queens College email, CUNY portal, Blackboard, and CUNYFirst. You may submit a ticket online or email support@qc.cuny.edu.

M115 Fall 2023 Schedule

Week 1	8/28, 8/30	Introduction & review
Week 2	9/6	Standard 1 **(No class on 9/4)**
Week 3	9/11, 9/13	Standards 2-3
Week 4	9/18, 9/20	Standards 4-5
Week 5	9/27	Standard 6 **(No class on 9/25)**
Week 6	10/2, 10/4	Review, **Exam 1** on Standards 1-6
Week 7	10/10, 10/11	Standard 7 **(No class on 10/9, Monday schedule on 10/10)**
Week 8	10/16, 10/18	Standards 8-9
Week 9	10/23, 10/25	Standards 9-10
Week 10	10/30, 11/1	Standards 10-11
Week 11	11/6, 11/8	Standards 11-12
Week 12	11/13, 11/15	Review, **Exam 2** on Standards 7-12
Week 13	11/20	Standard 13 **(No class on 11/22)**
Week 14	11/27, 11/29	Standards 13-14
Week 15	12/4, 12/6	Standard 15, Review
Week 16	12/11	Review, **Final Exam given the week of December 14-20**

M115 Content Standards

These standards align with the textbook *Intermediate Algebra, 2nd edition* by Marecek & Mathis on OpenStax. Corresponding sections of the textbook are noted in parentheses after each standard.

Standard 1: Functions. I can identify functions represented in various ways (graphs, sets of ordered pairs, or equations) and express their domain and range. I can apply the vertical line test to graphs. I can evaluate and simplify functions using function notation. (3.5, 3.6)

Standard 2: Linear Functions. I can identify linear functions, sketch their graphs, and find their zeros. I can convert linear equations from the form $Ax + By = C$ to the form $y = mx + b$ and determine the slope and x- and y-intercepts. I can sketch the graphs of $x = a$ and $y = b$ and state the properties of vertical and horizontal lines. I can solve application problems involving linear functions. (3.1, 3.2)

Standard 3: Slope and Equations of Lines. I can find the slope of a linear function given two points and use slopes to determine whether two lines are parallel or perpendicular. I can write the equation of a line given two points, one point and the slope, or one point and some characteristic of the slope. (3.2, 3.3)

Standard 4: Systems of Equations. I can distinguish between the three possibilities for the solutions of a system of two linear equations. I can solve a system of two linear equations using substitution or addition and solve application problems involving a system of two linear equations. (4.1, 4.2)

Standard 5: Exponents. I can apply the laws of exponents to fully simplify exponential expressions, including expressions with negative exponents. (5.2 – we do not cover scientific notation)

Standard 6: Polynomials. I can write a polynomial in descending order and identify the degree, leading coefficient, and constant term. I can evaluate a polynomial function and add, subtract, and multiply polynomials. I can divide a polynomial by a monomial by applying laws of exponents and I can divide polynomials by using long division. (5.1, 5.3, 5.4 – we do not cover synthetic division or the remainder and factor theorems)

Standard 7: Factoring Strategies. I can factor polynomials by factoring out the greatest common factor, factoring by grouping, and factoring trinomials (both when $a = 1$ and when $a \neq 1$). I can factor a polynomial in quadratic form and identify when a polynomial is prime. I can use the difference/sum of cubes formulas and difference of squares formula to factor. (6.1 – 6.3)

Standard 8: Factoring Applications. I can apply a variety of techniques to fully factor polynomials. I can solve quadratic equations by factoring and find the zeros of a quadratic function. (6.4, 6.5)

Standard 9: Rational Expressions I. I can identify rational expressions and determine their domains. I can evaluate rational functions and simplify, multiply, divide, add, and subtract rational expressions. (7.1, 7.2)

Standard 10: Rational Expressions II. I can simplify complex rational expressions and solve rational equations. (7.3, 7.4)

Standard 11: Radical Expressions I. I can identify radical expressions and determine their domains. I can evaluate and simplify expressions with rational exponents. I can simplify, add, and subtract radical expressions. (8.1 – 8.4)

Standard 12: Radical Expressions II. I can multiply and divide radical expressions by applying the product and quotient properties of radicals. I can rationalize radical expressions and solve radical equations. (8.4 – 8.6)

Standard 13: Quadratic Equations. I can identify the number of solutions to a quadratic equation. I can solve quadratic equations by factoring, taking a square root, completing the square, or using the quadratic formula. I can solve rational and radical equations that reduce to quadratic equations. (9.1 – 9.3)

Standard 14: Parabolas. I can sketch the graph of a quadratic function and identify the vertex, axis of symmetry, minimum/maximum point and value, and the x- and y-intercepts of a parabola. (11.2 – we do not cover graphing horizontal parabolas)

Standard 15: Formulas. I can apply the midpoint and distance formulas and write the equation of a circle given its center and radius or the endpoints of its diameter. (11.1)