MAT* K172   College Algebra   Spring 2018

13177 T3   TR 2:00 – 3:15 am **D 105**

INSTRUCTOR: Dr. Kelly Molkenthin (pronounced "molk-in-tine")
       Office: C 234, 860-215-9455
       Email: kmolkenthin@trcc.commnet.edu

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       Office Hours: Mondays: 3:20 pm – 4:20 pm
                         Tuesdays: 12:30 pm – 1:30 pm
                         Wednesdays: 9:20 am – 10:20 am
                         Thursdays: 8:20 am – 9:20 am
               and by appointment.
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REQUIRED MATERIAL:

       The text is *Precalculus, 1st Edition*. Coburn & Herdlick. McGraw Hill 2012. ISBN #9780073519531
       You can purchase a hardcover or paperback book with ALEKS 360 access code or just the electronic access kit
       (which includes ebook). You are required to purchase the access code for ***ALEKS 360***.

       Options: 1) Combo package; Includes copy of text, ALEX **360** (includes ebook). This gives
                              access for a full year to ALEKS.

                 or   2) ALEKS **360** 52 wk access code (includes ebook). This gives access for a full year to
                              ALEKS.

                 or   3) ALEKS **360** 18 wk access code (includes ebook). This gives access for Spring term
                              only to ALEKS.

CALCULATORS: Graphing calculators will be needed for many homework problems and it is required that you bring one
       to **every class**. Cell phones may **not** be used as calculators.

COMPUTERS: In this course, students will use an online program titled **ALEKS 360.** This program can be used
       on any computer or tablet with internet access. An access code for **ALEKS 360** is required. If you did not
       purchase a book that has an access code bundled with it, you will have to purchase an access code separately.
       One may be purchased at the TRCC bookstore or online at www.aleks.com.

       What is ALEKS?

               Assessment and **LE**arning in **K**nowledge **S**paces is a Web-based, artificially intelligent assessment and
               learning system. ALEKS uses adaptive questioning to quickly and accurately determine exactly what a
               student knows and doesn't know in a course. ALEKS then instructs the student on the topics they are
               most ready to learn. As a student works through a course, ALEKS periodically reassesses the student to
               ensure that topics learned are also retained. ALEKS courses are very complete in their topic coverage. A
               student who shows a high level of mastery of an ALEKS course will be successful in the actual course
               they are taking.

Course Code: TAF46 – QM6VV

GRADING: 4 Exams: 450 points (Exam #1, 2, 3: 100 points each, Exam #4: 150 points)
                  ALEKS: 300 points
                  Attendance & Participation   50 points
                  _____

                  Total: 800 points

Your final grade is the total number of points you have received divided by the total possible number of points. Final grades will be determined using the scale below:

A → 93% and above   **A-** → 90 - 92%

B+ → 87 - 89%   **B** → 83 - 86%   **B-** → 80 - 82%

C+ → 77 - 79%   **C** → 73 - 76%   **C-** → 70 - 72%

D+ → 67 - 69%   **D** → 63 – 66%   **D-** → 60 – 62%

EXTRA CREDIT: There will be **no** "extra credit" assignments for this course.

EXAMS: You will have three sectional exams and one final exam. Exams are (tentatively) scheduled for the following dates:

♦ **Exam 1: Thursday 2/15 (100 points)**

♦ **Exam 2: Thursday 3/22 (100 points)**

♦ **Exam 3: Thursday 4/19 (100 points)**

♦ **Exam 4: Thursday 5/10 (150 points)**

This <u>may</u> change (but hopefully not), depending on how we are doing. Make-ups for exams will be given only in **EXTREME** circumstances (to be determined by instructor: "vacations" or dentist/doctor appointments are NOT valid reasons to miss an exam, for example) AND if arrangements are made **PRIOR** to the missed exam. Any make-up must be completed by 10:30 am prior to the next class meeting day. No exam will be administered prior to the date/time of the scheduled exam. **No calls/no shows will receive a grade of 0 (zero)** on any exam. Your final exam is a cumulative **2 hour** final exam.

ALEKS: A five hour per week minimum level of student participation is required. This will account for 75 of the 300 ALEKS grade points. The five hour participation requirement is waived on a weekly basis ONLY if all current prerequisites have been completed, as well as current topic objectives (topic objectives will be determined at the end of each class meeting). In ALEKS students are expected to complete all objectives displayed in the four objective pies. Completion of each objective pie by its specified due date is worth a total of 200 grade points. Course mastery in ALEKS is worth 25 grade points.

            Weekly Time Goals: 75 points (5 each week)
            Objective Pies: 200 points
            Course Mastery: 25 points

            ❒ Time Goal #1 – due Wednesday 1/24, 11:59 pm (5 points)

            ❒ Time Goal #2 – due Wednesday 1/31, 11:59 pm (5 points)

            ❒ Time Goal #3 – due Wednesday 2/7, 11:59 pm (5 points)

            ❒ Time Goal #4 – due Wednesday 2/14, 11:59 pm (5 points)

❒ **Objective Pie #1: due Wednesday 2/14, 11:59 pm** (50 points)
Exam #1 – Thursday 2/15 (100 points)

❒ Time Goal #5 – due Wednesday 2/21, 11:59 pm (5 points)

❒ Time Goal #6 – due Wednesday, 2/28, 11:59 pm (5 points)

❒ Time Goal #7– due Wednesday 3/7, 11:59 pm (5 points)

❒ Time Goal #8 – due Wednesday 3/21, 11:59 pm (5 points)

❒ **Objective Pie #2: due Wednesday 3/21, 11:59 pm** (50 points)
Exam #2 – Thursday 3/22 (100 points)

❒ Time Goal #9 – due Wednesday 3/28, 11:59 pm (5 points)

❒ Time Goal #10 – due Wednesday 4/4, 11:59 pm (5 points)

❒ Time Goal #11 – due Wednesday 4/11, 11:59 pm (5 points)

❒ Time Goal #12 – due Wednesday 4/18, 11:59 pm (5 points)

❒ **Objective Pie #3: due Wednesday 4/18, 11:59 pm** (50 points)
Exam #5 – Thursday 4/19 (points)

❒ Time Goal #13 – due Wednesday 4/25, 11:59 pm (5 points)

❒ Time Goal #14 – due Wednesday 5/2, 11:59 pm (5 points)

❒ Time Goal #15 – due Wednesday 5/9, 11:59 pm (5 points)

❒ **Objective Pie #4: due Wednesday 5/9, 11:59** (50 points)

❒ **Course Mastery Pie: due Thursday 5/10, 2:00 pm** (25 points)

HOMEWORK: Keep a separate notebook for your text homework. Homework will be assigned on a regular basis. It is expected that you complete your homework by the next class meeting. BE SURE TO CHECK YOUR ANSWERS IN THE BACK OF THE TEXT. If you check the problem in the back of the text and it is not correct, re-do the problem. If you are struggling with the assignment, you need to seek out help from either your instructor or the tutor center ASAP!

*NOTE: Class time is reserved for presentation of material. Homework questions will be answered before or after class, or during meetings outside of class time.

EXPECTATION: Our expectation is that you are spending 2-3 hours of reading and doing homework for this class for every "academic" hour we meet in class. We meet 3 "academic" hours per week, therefore you should expect to spend *at least* **6 - 9 hours per week** on this class, outside of class meetings, every week!

ATTENDANCE & PARTICIPATION: All students start the semester will 50 "bonus" Attendance/Participation points. Points will be deducted for unexcused absences, late arrivals, early departures, cell phone, tablet or computer use during class time and other distracting classroom behavior (determined by instructor). Attendance is required and will be taken for each class.   An absence is excused ONLY for valid reasons (to be determined by the instructor) and if notification is given **PRIOR** to a missed class (via email, phone message – **not** word of mouth from another student). Oversleeping, "colds" and "vacations" are examples that are **not** valid reasons for an absence.
All absences reported by phone or reported to instructor in person **must be followed up with an email, or they will be considered unexcused. Do you best to not miss ANY classes!! Students are allowed a maximum of 2 excused absences per semester, excused absences will not affect your attendance and participation grade. Unexcused absences *will* lower your attendance and participation grade.

Also, if you miss a class it is **YOUR** responsibility to get the class notes from another student (refer to your class list) and **BE PREPARED** for the next class meeting (this includes taking a scheduled test).

Note: Class BEGINS at 2:00 pm.   It is expected that you will be in your seat and ready to go at 2:00 pm. Students arriving after 2:00 pm will lose attendance points for that class. Excessive "lateness" will not be tolerated, it is disruptive to both the instructor and the class. Excessive lateness will result in classroom doors being locked at 2:00 pm. Also, students leaving class prior to the scheduled end time will lose attendance points for that class unless arrangements have been made with the instructor prior to the class in which the student needs to leave early.

CELL PHONE POLICY: All cell phones must be turned OFF or MUTED before entering the classroom and properly placed in a bag or pocket (not left on a desk). Any cell phone use is rude and inappropriate, and will not be tolerated. Students found using cell phones in any way in class will lose their attendance points for that class period. Cell phones may NOT be used for calculators in class. All cell phones must be completely out of sight, especially for all exams. Any visible cell phone during an exam will result in a 0 for that exam.

CLASSROOM ETIQUETTE: Good manners and classroom etiquette should be common sense for most students. Occasionally there are students who seem unaware or oblivious to proper classroom etiquette. What is etiquette? It's a code of conduct, a method for dealing with how people interact with each other – based on respect and accepted norms of behavior.

1. Arrive to Class on Time.
   Regularly arriving late to class signals a level of disrespect -- whether you mean to send that signal or not. If you have problems getting to class on time, find a way to solve them. And on those rare days when you do arrive late, remember to enter the room quietly.

2. Turn Off Your Cell Phone.
   Unless you are expecting an important call or text (for which you will notify the instructor ahead of time), the proper thing to do is turn your cell phone completely off, or at least the volume off, as soon as you enter class and properly place it completely inside a pocket or bag.

3. Do Not Bring Food or Drink to Class
   Do not eat or drink in class, unless you are willing and able to clean up after yourself. In many classrooms food is not allowed, so be sure to check for signage.

4. Avoid Side Conversations.
   It is rude for students have a "private" conversation loudly enough that it's distracting to the instructor or other students in the classroom. If you have big news to share with your friends, do so before or after class -- but refrain from doing so during class. Besides being more respectful to the students and professor, you'll actually learn more information by being actively involved in the class rather than in your own side conversation.

5. Use appropriate language.
   Please refrain from using inappropriate or offensive language in and around the classroom. Save that for your private time and space.

6. Be Attentive in Class.
   If you are going to make the effort to arrive on time and be in class, you should also make the effort to stay actively engaged in class. Avoid reading magazines, textbooks or completing any homework during class time. Flaunting your boredom or disinterest in the class is rude -- and very inappropriate. Finally, please avoid falling asleep in class.

7. Stay for the Entire Class.
   There may be times when you need to leave class early, but do not make a habit of doing so. If you do need to leave class early, you must alert the professor ahead of time and then discretely leave the classroom so as not to disturb the other students. If you do need to leave early, pick a seat close to the door to make a quick and quiet exit.

8. Avoid Signaling, Sending Signs That Class Time is Up.
   Occasionally students attempt to signal that class is over by shutting their books loudly, unzipping and zipping their backpacks, and otherwise making noises indicating that class time is complete. Some students actually get up and walk out of class. I assure you I know how to tell time. If your professor does seem to have a problem with ending class on time, chat with him or her outside of class.

9. Contact the Professor When You Have to Miss Class.
   When you have to miss class for legitimate reasons or when you miss class because of illness, contact the professor before the class meeting and inform him/her of your absence. You then need to obtain copies of lecture notes for *another student.*   Do not, however, ask the professor in class to go over or re-lecture material you missed (for whatever reasons). And when alerting the professor of a missed a class, do not ask the awful question, "are we doing (or did we do) anything important in the class I am missing/missed?"

CLASS CANCELATION: In the unlikely event that a class needs to be canceled by the instructor, a notice will be placed on the classroom door prior to the start of class. If time permits, you will be notified by the instructor via email as soon as possible prior to the canceled class.
For college cancelations, pay attention to the radio & TV announcements, call the college's main phone number, 860-215-9000, or visit the college's home page, www.trcc.commnet.edu. Please: DO NOT email or call your instructor regarding school closings!
It is also suggested all students register for **The MyCommnet Alert Notification System.** This system is used to deliver important information to students, faculty, and staff regarding weather-related class cancellations. The system delivers both email messages, and text messages over cellular phones to those individuals who are registered. To register, log on to your MyCommnet account at http://my.commnet.edu/ and follow the link to MyCommnet Alert.

**For DELAYED college opening or EARLY college closing: If there is 45 minutes or more of class time from the start of a delayed opening or from the start of class until an early closing, we WILL still have class.

STUDENT EMAIL: When registering for ALEKS, please use an email you check most frequently. If the instructor needs to email the entire class, it will be done through ALEKS (which, in turn, gets automatically forwarded to the email you used to registered for ALEKS).

RETENTION OF PAPERS: Students are expected to retain all graded work until final grades are received.

COMMUNICATION: Verbal communication with the instructor regarding missed classes, test make-ups, special accommodations, etc. **must** be followed up with an email (kmolkenthin@trcc.commnet.edu) as soon as possible. This is essential!

ACADEMIC DISHONESTY: Academic integrity is essential in all aspects of college coursework and learning. I have zero tolerance for academic dishonesty. It is expected that **YOU** complete all your assigned ALEKS work. Communication or collaboration of ANY sort is ABSOLUTEY PROHIBITED during any exam.   Academic Misconduct is punishable in a number of ways, including a score of a zero on the assignment where the cheating took place, a grade of an F in the course and/or possible censure on your permanent record. All cases of academic dishonesty will be referred to the Academic Dean. Do not let yourself come under the suspicion of academic dishonesty.

COURSE OBJECTIVES: This course is a thorough and rigorous algebra course that strengthens the proficiency with algebraic skills and the conceptual understanding needed to be successful in the Calculus sequence. The topics include: sets, polynomial, exponential, logarithmic and rational functions, rational exponents, conic sections, right triangle trigonometry, matrices, polynomial, exponential, logarithmic and radical equations, linear and quadratic inequalities, absolute value equations and inequalities, linear systems.

Upon Completion of the course, the student should be able to:

1) Define absolute value, find distances on the number line and the coordinate plane.

2) Simplify expressions with rational exponents, write them in radical form, simplify, combine and rationalize radical expressions.

3) Solver linear and quadratic inequalities, absolute value equations and inequalities, express answers in interval form.

4) Perform operations on complex numbers, conjugates, represent complex numbers graphically.

5) Perform operations on radical expressions, rational exponents, solve radical equations.

6) Find the domain and range of function's, combine functions, identify even and odd functions, graph piece-wise functions, find composition of functions, inverse and transforms of functions.

7) Find the characteristics of polynomial functions, solve polynomial equations, find zeros (roots) and x-intercepts of polynomials, apply the Fundamental Theorem of Algebra, The Remainder Theorem, The Factor Theorem, analyze end behavior.

8) Graph rational functions, find vertical, horizontal and slant asymptotes.

9) Graph exponential and logarithmic functions, use properties of exponents and logarithms, solve exponential and logarithmic equations.

10) Solve systems of linear equations in several variables

ACCOMMODATIONS: Students with learning disabilities should contact the Learning Specialist, Matt Liscum, at 860-215-9265 or via email at mliscum@trcc.commnet.edu as soon as possible to ensure timely accommodations. Students with physical disabilities should contact Elizabeth Willcox at 860-215-9289 or via email at ewillcox@trcc.commnet.edu to facilitate accommodations. All testing accommodations MUST be discussed with the instructor in a timely manner, that is, *at least* one to two class meetings **prior** to any scheduled test for which accommodations are needed.

BOARD OF REGENTS FOR HIGHTER EDUCATION AND CONNECTICUT STATE COLLEGES AND UNIVERSITIES POLICY REGARDING SEXUAL MISCONDUCT REPORTING, SUPPORT SERVICES AND PROCESSES POLICY

Statement of Policy for Public Act No. 14-11: An Act Concerning Sexual Assault, Stalking and Intimate Partner Violence on Campus:

"The Board of Regents for Higher Education (BOR) in conjunction with the Connecticut State Colleges and Universities (CSCU) is committed to insuring that each member of every BOR governed college and university community has the opportunity to participate fully in the process of education free from acts of sexual misconduct, intimate partner violence and stalking. It is the intent of the BOR and each of its colleges or universities to provide safety, privacy and support to victims of sexual misconduct and intimate partner violence."

The key to success in this course is to attend every class and do all the homework when it is assigned. Ask questions when you have them, either in class or in my office. You will find it much easier to learn the new topics if you consistently keep up with the course material and homework problems!

The instructor has the right to change/modify this syllabus at any time with proper notification to the class

COURSE CONTENT - MAT* K172, Spring 2018   (Note: * - denotes review topics)

Chapter 1: **Relations, Functions, and Graphs**
- *1.1) Rectangular Coordinates, Graphing Circles and Other Relations
- *1.2) Linear Equations and Rates of Change
- *1.3) Functions, Function Notation, and the Graph of a Function
- *1.4) Linear Functions, Special Forms, and More of Rates of Change
- 1.5) Solving Equations and Inequalities Graphically; Formulas
- 1.6) Linear Function Models and Real Data

Chapter 2: **More on Functions**
- 2.1) Analyzing the Graph of a Function
- 2.2) The Toolbox Functions and Transformations
- 2.3) Absolute Value Functions, Equations, and Inequalities
- 2.4) Basic Rational Functions and Power Functions
- 2.5) Piecewise-Defined Functions
- 2.6) Variation: The Toolbox Functions in Action

ALEKS® Course Syllabus

Dates:
Objective:

01/18/2018 - 02/14/2018	**1.** Ch.1-Relations, Functions, and Graphs (75 topics)
01/18/2018 - 02/14/2018	**2.** Ch.2-More on Functions (51 topics)
02/15/2018 - 03/21/2018	**3.** Appendix A-A Review of Basic Concepts and Skills (19 topics)
02/15/2018 - 03/21/2018	**4.** Ch.3-Quadratic Functions and Operations on Functions (47 topics)
03/22/2018 - 04/18/2018	**5.** Ch.9-Systems of Equations and Inequalities (10 topics)
03/22/2018 - 04/18/2018	**6.** Ch.4-Polynomial and Rational Functions (23 topics)
04/19/2018 - 05/09/2018	**7.** Ch.5-Exponential and Logarithmic Functions (45 topics)

Ch.1-Relations, Functions, and Graphs (61 topics, due on 02/14/2018)

Section 1.1 (10 topics)

- Distance between two points in the plane: Exact answers
- Midpoint of a line segment in the plane
- Writing an equation of a circle given its center and a point on the circle
- Writing an equation of a circle given the endpoints of a diameter
- Identifying the center and radius to graph a circle given its equation in standard form
- Identifying the center and radius to graph a circle given its equation in general form: Basic
- Identifying the center and radius to graph a circle given its equation in general form: Advanced
- Distance between two points in the plane: Decimal answers
- Writing the equation of a circle centered at the origin given its radius or a point on the circle
- Writing an equation of a circle given its center and radius or diameter

Section 1.2 (10 topics)

- Graphing a line given its equation in standard form
- Graphing a vertical or horizontal line
- Finding x- and y-intercepts given the graph of a line on a grid
- Graphing a line given its x- and y-intercepts
- Graphing a line by first finding its x- and y-intercepts
- Finding slope given the graph of a line on a grid
- Finding slope given two points on the line
- Writing the equations of vertical and horizontal lines through a given point
- Writing and evaluating a function that models a real-world situation: Advanced
- Identifying parallel and perpendicular lines from coordinates

Section 1.3 (25 topics)

- Graphing a linear inequality on the number line
- Writing an inequality given a graph on the number line
- Graphing a compound inequality on the number line
- Writing a compound inequality given a graph on the number line
- Identifying functions from relations
- Vertical line test
- Evaluating functions: Linear and quadratic or cubic
- Evaluating a rational function: Problem type 1
- Evaluating a rational function: Problem type 2

- Table for a square root function
- Evaluating a cube root function
- Evaluating functions: Absolute value, rational, radical
- Variable expressions as inputs of functions: Problem type 1
- Domain of a square root function: Basic
- Domain of a square root function: Advanced
- Finding the domain of a fractional function involving radicals
- Finding an output of a function from its graph
- Finding inputs and outputs of a function from its graph
- Domain and range from the graph of a discrete relation
- Domain and range from the graph of a continuous function
- Interpreting the graphs of two functions
- Variable expressions as inputs of functions: Problem type 3
- Domain of a rational function: Interval notation
- Domain of a rational function: Excluded values
- Variable expressions as inputs of functions: Problem type 2

Section 1.4 (11 topics)

- Finding the slope and y-intercept of a line given its equation in the form $y = mx + b$
- Finding the slope and y-intercept of a line given its equation in the form $Ax + By = C$
- Writing an equation of a line given its slope and y-intercept
- Writing an equation in slope-intercept form given the slope and a point
- Writing an equation of a line given the y-intercept and another point
- Writing the equation of the line through two given points
- Finding slopes of lines parallel and perpendicular to a line given in slope-intercept form
- Finding slopes of lines parallel and perpendicular to a line given in the form $Ax + By = C$
- Identifying parallel and perpendicular lines from equations
- Writing equations of lines parallel and perpendicular to a given line through a point
- Finding where a function is increasing, decreasing, or constant given the graph

Section 1.5 (2 topics)

- Solving for a variable in terms of other variables using multiplication or division: Advanced
- Solving for a variable in terms of other variables using addition or subtraction with division

Chapter 1 Supplementary Topics (3 topics)

- Classifying slopes given graphs of lines
- Finding the slope of horizontal and vertical lines
- Domain and range from the graph of a piecewise function

Ch.2-More on Functions (52 topics, due on 02/14/2018)

Section 2.1 (9 topics)

- Finding intercepts of a nonlinear function given its graph
- Domain and range from the graph of a continuous function
- Finding where a function is increasing, decreasing, or constant given the graph
- Finding where a function is increasing, decreasing, or constant given the graph: Interval notation
- Finding local maxima and minima of a function given the graph
- Even and odd functions: Problem type 1
- Finding values and intervals where the graph of a function is zero, positive, or negative

- Finding the absolute maximum and minimum of a function given the graph
- Determining if graphs have symmetry with respect to the x-axis, y-axis, or origin

Section 2.2 (22 topics)

- Graphing an absolute value equation of the form $y = A|x|$
- Graphing a cubic function of the form $y = ax^3$
- Graphing a function of the form $f(x) = ax + b$: Integer slope
- Graphing a function of the form $f(x) = ax + b$: Fractional slope
- Graphing a function of the form $f(x) = ax^2$
- Graphing a function of the form $f(x) = ax^2 + c$
- Graphing a parabola of the form $y = (x-h)^2 + k$
- Graphing a square root function: Problem type 1
- Graphing a cube root function
- How the leading coefficient affects the shape of a parabola
- Translating the graph of an absolute value function: Two steps
- How the leading coefficient affects the graph of an absolute value function
- Writing an equation for a function after a vertical translation
- Translating the graph of a function: Two steps
- Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
- Translating the graph of a parabola: One step
- Transforming the graph of a quadratic, cubic, square root, or absolute value function
- Domain and range from the graph of a quadratic function
- Translating the graph of an absolute value function: One step
- Translating the graph of a function: One step
- Translating the graph of a parabola: Two steps
- Transforming the graph of a function by reflecting over an axis

Section 2.3 (9 topics)

- Solving an absolute value equation: Problem type 1
- Solving an absolute value equation: Problem type 2
- Solving an absolute value equation: Problem type 3
- Solving an absolute value equation: Problem type 4
- Solving an absolute value inequality: Problem type 1
- Solving an absolute value inequality: Problem type 2
- Solving an absolute value inequality: Problem type 3
- Solving an absolute value inequality: Problem type 4
- Solving an absolute value inequality: Problem type 5

Section 2.5 (3 topics)

- Evaluating a piecewise-defined function
- Graphing a piecewise-defined function: Problem type 1
- Graphing a piecewise-defined function: Problem type 2

Section 2.6 (5 topics)

- Writing a direct variation equation
- Word problem on direct variation
- Writing an inverse variation equation
- Word problem on inverse variation
- Word problem on combined variation

Chapter 2 Supplementary Topics (4 topics)

- Graphing an absolute value equation in the plane: Basic
- Graphing an absolute value equation in the plane: Advanced
- Matching parent graphs with their equations
- Classifying the graph of a function

**EXAM #1 – Thursday 2/15

Appendix A-A Review of Basic Concepts and Skills (15 topics, due on 03/21/2018)

Section A.5 (8 topics)

- Restriction on a variable in a denominator: Linear
- Solving a rational equation that simplifies to linear: Denominator x+a
- Solving a rational equation that simplifies to linear: Like binomial denominators
- Solving a rational equation that simplifies to linear: Unlike binomial denominators
- Solving a rational equation that simplifies to linear: Factorable quadratic denominator
- Solving a rational equation that simplifies to quadratic: Binomial denominators, constant numerators
- Solving a rational equation that simplifies to quadratic: Binomial denominators and numerators
- Solving a rational equation that simplifies to quadratic: Factorable quadratic denominator

Section A.6 (7 topics)

- Solving an equation of the form $x^2 = a$ using the square root property
- Solving a radical equation that simplifies to a linear equation: One radical, advanced
- Solving a radical equation that simplifies to a linear equation: Two radicals
- Solving a radical equation with two radicals that simplifies to sqrt(x) = a
- Solving a radical equation that simplifies to a quadratic equation: One radical, basic
- Solving a radical equation that simplifies to a quadratic equation: One radical, advanced
- Solving a radical equation that simplifies to a quadratic equation: Two radicals

Ch.3-Quadratic Functions and Operations on Functions (47 topics, due on 03/21/2018)

Section 3.1 (6 topics)

- Using i to rewrite square roots of negative numbers
- Simplifying a product and quotient involving square roots of negative numbers
- Adding or subtracting complex numbers
- Multiplying complex numbers
- Dividing complex numbers
- Simplifying a power of i

Section 3.2 (14 topics)

- Finding the roots of a quadratic equation with leading coefficient 1
- Finding the roots of a quadratic equation with leading coefficient greater than 1
- Solving a word problem using a quadratic equation with rational roots
- Solving an equation of the form $x^2 = a$ using the square root property
- Solving a quadratic equation using the square root property: Exact answers, basic
- Solving a quadratic equation using the square root property: Exact answers, advanced
- Completing the square
- Solving a quadratic equation by completing the square: Exact answers

- Applying the quadratic formula: Exact answers
- Applying the quadratic formula: Decimal answers
- Solving a quadratic equation with complex roots
- Discriminant of a quadratic equation
- Solving a word problem using a quadratic equation with irrational roots
- Finding the zeros of a quadratic function given its equation

Section 3.3 (12 topics*)

- Solving a word problem using a quadratic equation with irrational roots
- Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
- Graphing a parabola of the form $y = x^2 + bx + c$
- Graphing a parabola of the form $y = ax^2 + bx + c$: Integer coefficients
- Graphing a parabola of the form $y = ax^2 + bx + c$: Rational coefficients
- Finding the x-intercept(s) and the vertex of a parabola
- Finding the maximum or minimum of a quadratic function
- Word problem involving the maximum or minimum of a quadratic function
- Writing the equation of a quadratic function given its graph
- Word problem involving optimizing area by using a quadratic function
- Graphing a parabola of the form $y = a(x-h)^2 + k$
- Writing a quadratic function given its zeros

Section 3.4 (3 topics)

- Finding the average rate of change of a function
- Finding the average rate of change of a function given its graph
- Word problem involving average rate of change

Section 3.5 (4 topics)

- Sum, difference, and product of two functions
- Quotient of two functions: Basic
- Combining functions: Advanced
- Quotient of two functions: Advanced

Section 3.6 (8 topics)

- Finding a difference quotient for a linear or quadratic function
- Composition of two functions: Basic
- Expressing a function as a composition of two functions
- Composition of two functions: Domain and range
- Composition of two functions: Advanced
- Composition of a function with itself
- Introduction to the composition of two functions
- Composition of two rational functions

Chapter 3 Supplementary Topics (1 topic)

- Finding a difference quotient for a rational function

**EXAM #2 – Thursday 3/22

Ch.9-Systems of Equations and Inequalities (10 topics, due on 04/18/2018)

Section 9.1 (6 topics)

- Identifying solutions to a system of linear equations
- Solving a system of linear equations using substitution
- Solving a system of linear equations using elimination with addition
- Solving a system of linear equations using elimination with multiplication and addition
- Solving a system of linear equations with fractional coefficients
- Solving a 2x2 system of linear equations that is inconsistent or consistent dependent

Section 9.2 (4 topics)

- Solving a 3x3 system of linear equations: Problem type 1
- Introduction to solving a 3x3 system of linear equations
- Solving a 3x3 system of linear equations: Problem type 2
- Solving a 3x3 system of linear equations that is inconsistent or consistent dependent

Ch.4-Polynomial and Rational Functions (29 topics, due on 04/18/2018)

Section 4.1 (7 topics)

- Finding a polynomial of a given degree with given zeros: Real zeros
- Polynomial long division: Problem type 1
- Polynomial long division: Problem type 2
- Synthetic division
- Using the remainder theorem to evaluate a polynomial
- The Factor Theorem
- Using a given zero to write a polynomial as a product of linear factors: Real zeros

Section 4.2 (8 topics)

- Finding all possible rational zeros using the rational zeros theorem: Problem type 1
- Finding all possible rational zeros using the rational zeros theorem: Problem type 2
- Using the rational zeros theorem to find all zeros of a polynomial: Rational zeros
- Using the rational zeros theorem to find all zeros of a polynomial: Irrational zeros
- Multiplying expressions involving complex conjugates
- Finding a polynomial of a given degree with given zeros: Complex zeros
- Using a given zero to write a polynomial as a product of linear factors: Complex zeros
- Using the rational zeros theorem to find all zeros of a polynomial: Complex zeros

Section 4.3 (7 topics)

- Finding zeros of a polynomial function written in factored form
- Finding x- and y-intercepts given a polynomial function
- Determining the end behavior of the graph of a polynomial function
- Inferring properties of a polynomial function from its graph
- Matching graphs with polynomial functions
- Determining end behavior and intercepts to graph a polynomial function
- Finding zeros and their multiplicities given a polynomial function written in factored form

Section 4.4 (6 topics)

- Finding the asymptotes of a rational function: Constant over linear
- Finding the asymptotes of a rational function: Linear over linear
- Finding horizontal and vertical asymptotes of a rational function: Quadratic numerator or denominator
- Graphing a rational function: Constant over linear
- Graphing a rational function: Linear over linear
- Matching graphs with rational functions: Two vertical asymptotes

Section 4.5 (1 topic)

- Graphing rational functions with holes

**EXAM #3 – Thursday 4/19

Ch.5-Exponential and Logarithmic Functions (45 topics, due on 05/09/2018)

Section 5.1 (7 topics)

- Horizontal line test
- Determining whether two functions are inverses of each other
- Inverse functions: Linear, discrete
- Inverse functions: Rational
- Finding, evaluating, and interpreting an inverse function for a given linear relationship
- Inverse functions: Quadratic, square root
- Inverse functions: Cubic, cube root

Section 5.2 (13 topics)

- Table for an exponential function
- Translating the graph of an exponential function
- The graph, domain, and range of an exponential function
- Graphing an exponential function and its asymptote: $f(x) = a(e)^{x-b} + c$
- Evaluating an exponential function that models a real-world situation
- Solving an exponential equation by finding common bases: Linear exponents
- Transforming the graph of a natural exponential function
- Using a calculator to evaluate exponential expressions
- Using a calculator to evaluate exponential expressions involving base e
- Graphing an exponential function and its asymptote: $f(x)=b^x$
- Graphing an exponential function and its asymptote: $f(x) = a(b)^x$
- Graphing an exponential function and its asymptote: $f(x)=b^{-x}$ or $f(x)=-b^{ax}$
- Finding domain and range from the graph of an exponential function

Section 5.3 (8 topics)

- Translating the graph of a logarithmic function
- Graphing a logarithmic function: Basic
- The graph, domain, and range of a logarithmic function
- Domain of a logarithmic function: Advanced
- Using a calculator to evaluate natural and common logarithmic expressions
- Converting between logarithmic and exponential equations
- Converting between natural logarithmic and exponential equations
- Evaluating logarithmic expressions

Section 5.4 (9 topics)

- Solving an equation of the form $\log_b a = c$
- Expanding a logarithmic expression: Problem type 1
- Writing an expression as a single logarithm
- Change of base for logarithms: Problem type 1
- Solving an exponential equation by using natural logarithms: Decimal answers
- Expanding a logarithmic expression: Problem type 2
- Solving a multi-step equation involving a single logarithm: Problem type 1
- Solving a multi-step equation involving a single logarithm: Problem type 2
- Basic properties of logarithms

Section 5.5 (7 topics)

- Evaluating an exponential function with base e that models a real-world situation
- Solving a multi-step equation involving natural logarithms
- Solving an equation involving logarithms on both sides: Problem type 2
- Solving an equation involving logarithms on both sides: Problem type 1
- Solving an exponential equation by using logarithms: Decimal answers, basic
- Solving an exponential equation by using logarithms: Exact answers in logarithmic form
- Solving an exponential equation by using logarithms: Decimal answers, advanced

Chapter 5 Supplementary Topics (1 topic)

- Writing an exponential function rule given a table of ordered pairs

EXAM #4 – Thursday 5/10