

T1 30178 TR 12:30 – 1:45 pm E 221  
T2 31525 TR 2:00 – 3:15 pm E 221

**INSTRUCTOR:** Dr. Kelly Molkenthin (pronounced “molk-in-tine”)  
Office: C 234, 860-215-9455  
Email: [kmolkenthin@trcc.commnet.edu](mailto:kmolkenthin@trcc.commnet.edu)

\*\*\*\*\*

Office Hours: Mondays 3:25 – 4:25 pm  
Tuesdays 3:45 – 4:45 pm  
Wednesdays 3:25 – 4:25 pm  
Thursdays 11:15 am – 12:15 pm  
and by appointment.

\*\*\*\*\*

**COURSE DESCRIPTION:**

Prerequisite: MAT\* K095 or MAT\* K095I with a “B- #” grade or better or appropriate placement through multiple-measures assessment process.

This course cultivates understanding and different representations of functions. Topics covered include linear, quadratic, exponential, rational, radical functions, equations, and expressions with emphasis on modeling and solving real world problems. A graphing calculator is required.

**REQUIRED MATERIAL:**

- Graphing Calculator: calculators will be needed for many homework problems and it is **REQUIRED** that you bring one to **every class** and **each exam**. TI-89 and TI-Inspire calculators may **NOT** be used on exams. Cell phones may not be used as calculators in class or during exams.
- Text: Elementary and Intermediate Algebra 5th Ed., Baratto & Bergman. You can purchase a hardcover or paperback book with ALEKS access code or just the electronic access kit (which includes ebook).
- 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.
- 2) ALEKS **360** 52 week access code (includes ebook), This gives access for a full year to ALEKS.

or 3) ALEKS **360** 18 week access code (includes ebook), This gives access for spring term only to ALEKS

**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 which 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](http://www.aleks.com).

What is ALEKS?

**A**ssessment and **L**earning 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 she is 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 she/he is taking.

## LEARNING OUTCOMES

Upon successful completion of this class a student should be able to:

### FACTORING

- 1) Factor monomials
- 2) Factor polynomials by grouping
- 3) Factor perfect square trinomials, difference of squares, sum/difference of cubes
- 4) Factor quadratics

### Quadratic Functions and/or Expressions

- 1) Provide multiple representations of quadratic functions or expressions by hand and/or using technology
- 2) Determine identifying characteristics of quadratic functions or expressions (e.g., factors)
- 3) Evaluate, simplify, and perform operations on quadratic functions or expressions
- 4) Solve quadratic equations algebraically (e.g., factoring, completing the square, and quadratic formula with rational solutions) and/or graphically
- 5) Solve real world applications involving quadratic equations and functions

### Radical Functions and/or Expressions

- 1) Provide multiple representations of simple radical functions or expressions by hand and/or using technology, with primary emphasis on square root
- 2) Determine identifying characteristics of radical functions or expressions
- 3) Evaluate, simplify, and perform operations on simple radical functions or expressions
- 4) Solve simple radical equations algebraically and/or graphically
- 5) Solve real world applications involving radical functions
- 6) Identify imaginary numbers

### Rational Functions and/or Expressions

- 1) Provide multiple representations of simple rational functions or expressions by hand and/or using technology
- 2) Determine identifying characteristics of rational functions or expressions
- 3) Evaluate, simplify, and perform operations on simple rational functions or expressions
- 4) Solve simple rational equations algebraically and/or graphically
- 5) Solve real world applications involving rational functions

### Exponential Functions and/or Expressions

- 1) Provide multiple representations (e.g., tables, graphs, symbols) of exponential functions or expressions by hand and/or using technology
- 2) Determine identifying characteristics of exponential functions or expressions
- 3) Evaluate, simplify, and perform operations on exponential functions or expressions
- 4) Identify real world applications involving exponential functions and/or solve graphically

### Mathematical Practices

- 1) Make sense of problems and persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 2) Construct viable arguments and critique the reasoning of others.
- 3) Model with mathematics.
- 4) Use appropriate tools strategically.
- 5) Attend to precision.
- 6) Look for and make use of structure.
- 7) Look for and express regularity in repeated reasoning

<b>GRADING:</b>	4 One-Hour Exams:	400 points (100 each)
	Final Exam:	150 points
	ALEKS	200 points
	Attendance/Participation:	50 points
	Total:	800 points

#### GRADING POLICIES:

- ♦ **Late Work/ Missed Work Make-Up Policy:** Late work is not accepted. All ALEKS work must be completed by the predetermined day/time.
- ♦ **Extra Credit:** There will be **no** “extra credit” assignments for this course.

#### LETTER GRADE EQUIVALENTS:

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:

<b>A</b> → 93% and above	<b>A-</b> → 90 - 92%	
<b>B+</b> → 87 - 89%	<b>B</b> → 83 - 86%	<b>B-</b> → 80 - 82%
<b>C+</b> → 77 - 79%	<b>C</b> → 73 - 76%	<b>C-</b> → 70 - 72%
<b>D+</b> → 67 - 69%	<b>D</b> → 63 - 66%	<b>D-</b> → 60 - 62%

**EXAMS:** You will have four in-class exams and one 2 hour in-class final exam. Exams are scheduled for the following dates:

- ♦ **Exam 1: Thursday 9/26/19**
- ♦ **Exam 2: Thursday 10/24/19**
- ♦ **Exam 3: Thursday 11/14/19**
- ♦ **Exam 4: Thursday 12/05/19**
- ♦ **Final Exam: Thursday 12/12/19**

This may 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 12:30 pm 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. You must be in your seat, ready to go for any test/exam *prior* to the start of the exam. Late arrivals are not allowed. Your final exam is a cumulative **2 hour** final exam. You will need to sign up for a 2 hour block on Thursday, 12/12/19 for your final exam. Please plan accordingly.

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

**ALEKS:** A five hour per week minimum level of student participation is required. This will account for 75 of the 200 ALEKS grade points. The five hour participation requirement is waived on a weekly basis **ONLY** if all the current prerequisites have been completed, as well as current topic objectives (topic objectives will be determined at the end of each class meeting, and objective % will be determined weekly). In ALEKS students are expected to complete six intermediate objectives displayed in four objective pies. Completion of each objective pie by its specified due date is worth a total of 100 grade points. Course mastery in ALEKS is worth 25 grade points.

- ♦ Time Goal #1 – due Wednesday 9/04/19, 11:59 pm
- ♦ Time Goal #2 – due Wednesday 9/11/19, 11:59 pm
- ♦ Time Goal #3 – due Wednesday 9/18/19, 11:59 pm
- ♦ Time Goal #4 – due Wednesday 9/25/19, 11:59 pm

- ♦ **Objective Pie #1: due Wednesday 9/25/19, 11:59 pm**

**Exam #1 – Thursday 9/26/19**

- ♦ Time Goal #5 – due Wednesday 10/02/19, 11:59 pm
- ♦ Time Goal #6 – due Wednesday 10/09/19, 11:59 pm
- ♦ Time Goal #7 – due Wednesday 10/16/19 11:59 pm
- ♦ Time Goal #8 – due Wednesday 10/23/19, 11:59 pm
- ♦ **Objective Pie #2: due Wednesday 10/23/19, 11:59 pm**

**Exam #2 – Thursday 10/24/19**

- ♦ Time Goal #9 – due Wednesday 10/30/19, 11:59 pm
- ♦ Time Goal #10 – due Wednesday 11/06/19, 11:59 pm
- ♦ Time Goal #11 – due Wednesday 11/13/19, 11:59 pm
- ♦ **Objective Pie #3: due Wednesday 11/13/19, 11:59 pm**

**Exam #3 – Thursday 11/14/19**

- ♦ Time Goal #12 – due Wednesday 11/20/19, 11:59 pm
- ♦ Time Goal #13 – due Wednesday 11/27/19, 11:59 pm
- ♦ Time Goal #14 – due Wednesday 12/04/19, 11:59 pm
- ♦ **Objective Pie #4: due Wednesday 12/04/19, 11:59 pm**

**Exam #4 – Thursday 12/05/19**

- ♦ Time Goal #15 – due Wednesday 12/11/19, 11:59 pm
- ♦ **Objective Pie #5: due Wednesday 12/11/19, 11:59 pm**
- ♦ **Course Mastery Pie: due Thursday 12/12/19, 12:30 pm**

**\*\*2 hour\*\* Final Exam – Thursday 12/12/19**

**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!

**HOMEWORK QUESTIONS:** Class time is reserved for presentation of material. Homework questions will be answered outside class meetings.

**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/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 your 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- instructor **DOES NOT** provide notes for missed classes) and **BE PREPARED** for the next class meeting (this includes taking scheduled exams).\*\*\*

**Note: Class BEGINS at 12:30 pm (T1) and at 2:00 pm (T2).** It is expected that you will be in your seat and ready to go at the start of the class time. Plan to arrive to class 5 minutes prior to the scheduled start time. Students arriving after the start of class time will lose attendance points for that class. Excessive "lateness" will not be tolerated, it is disruptive to both the instructor and the class. Emergencies and special circumstances can typically be accommodated – especially when discussed with the teacher in advance. However, regular late arrivals and early departures are unwanted interruptions that affect the classroom as a whole.

**COMMUNICATION:** All communication will occur by email (kmolkenthin@trcc.commnet.edu). Please make sure that you check your TRCC email or set it up to forward to another account. Check your email regularly to be informed of any changes in schedule.

**CLASS CANCELLATION:** If school is cancelled, notification of cancellation due to inclement weather will be available by telephone by 6:00 am for daytime classes and by 2:30 pm for evening classes by calling the College's main telephone at (860) 215-9000, pressing 1, and listening to the taped announcement. The College's website will also have announcements available by accessing the [www.threerivers.edu](http://www.threerivers.edu) home page. The myCommnet Alert Notification System will also be used to deliver important information regarding weather-related class cancellations, via both email messages and text messages, to registered individuals. To register, log on to your myCommnet account at <http://my.commnet.edu/> and follow the link to myCommnet Alert. Please: DO NOT email or call instructor regarding weather delays/closings.

If class is cancelled by the instructor, a notice will be placed on the classroom door. If time permits, students may be notified by a message via email.

**\*\*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.

**WITHDRAWAL POLICY:** You may withdraw from this class any time up to and including **November 5** and you will receive a W grade on your transcript. However, you must complete a withdrawal form in the Registrar's Office at the time of withdrawal; *if you merely stop attending classes you will be assigned a grade of F or UF*. Any eligibility for refund of tuition is based on the date that the registrar receives the withdrawal.

**INCOMPLETES:** Incompletes will be given in *extreme* situations (to be determined by the instructor) and ONLY if most of the course work has been completed (*at least 80%*).

**ACADEMIC INTEGRITY:** The effective operation of any organization is dependent on the honesty and goodwill of its members. In an organization devoted to the pursuit of knowledge, acting with integrity is essential to effective teaching and learning. Furthermore, academic dishonesty erodes the legitimacy of every degree awarded by the College. To emphasize the importance of academic integrity, Three Rivers Community College adheres to the Student Code of Conduct and Discipline Policy, as provided by the Connecticut State Colleges and Universities (CSCU) - Board of Regents for Higher Education. (Please refer to BlackBoard for the complete statement.)

**Some** of the behaviors that will be considered cheating are:

- Communicating with another student during a quiz or exam
- Copying material from another student during a quiz or exam or from any assignment being graded
- Allowing another student to copy from your quiz, exam, or any assignment being graded
- Use of unauthorized assistance on any assignment being graded
- Use of unauthorized notes or books during a quiz or exam
- Providing or receiving a copy of a quiz or exam used in the course
- Use of a cell phone or pager to transmit information during a quiz or exam

All cases of academic dishonesty will be referred to the Academic Dean. Do not let yourself come under the suspicion of academic dishonesty.

**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. Also, remove any ear buds/headphones and place in a pocket or bag prior to the start of the class.

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. 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, completing any homework or computer use during class time. Flaunting your boredom or disinterest in the class is rude and inappropriate. Finally, please avoid falling asleep in class.

6. 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.

7. 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 you have a professor that seems to have a problem with ending class on time, chat with him or her outside of class.

8. 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 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?"

9. Avoid strong odors

Too much perfume, cigarette odor or other strong odors, including foods odors, can be distracting or even nauseating to students and instructors, especially those with allergies or migraine issues. Please avoid bringing strong odors into the classroom.

**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). Cell phone use in class 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 during exams. All cell phones must be completely out of sight for all tests/exams. Any visible cell phone during an exam will result in a 0 for that exam – no exceptions.

**SCHOOL POLICIES:** Please refer to BlackBoard or the TRCC website for a link to the entire policy.

- **DIGICATION:** All students are required to maintain an electronic portfolio using the College template within Digication. Digication can be accessed at <https://threerivers.digication.com>.
- **DISABILITIES:** Three Rivers Community College (TRCC) is committed to the goal of achieving equal educational opportunity and full participation for individuals with disabilities. To this end, TRCC seeks to ensure that no qualified person is excluded from participation in, is denied the benefit of, or otherwise is subjected to discrimination in any of its programs, services, or activities.
- **NON-DISCRIMINATION:** Three Rivers Community College does not discriminate on the basis of race, color, religious creed, age, sex, national origin, marital status, ancestry, present or past history of mental disorder, learning disability or physical disability, sexual orientation, gender identity and expression, or genetic information in its programs and activities.
- **SEXUAL MISCONDUCT:** The Board of Regents for Higher Education (BOR) in conjunction with the Connecticut State Colleges and Universities (CSCU) is committed to ensuring 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.

**ACCEPTANCE POLICY:** After reading this syllabus, choosing to stay registered for this course exemplifies your acceptance of the syllabus and all policies and consequences outlined in the syllabus. If you do not agree with any of the terms in the syllabus, you are free to withdraw.

**\*\*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!\*\***

<u>Week of:</u>	<u>Chapter(s):</u>	<u>Topics Covered:</u>
8/27	2.5, 2.6	Relations & Functions
9/3	6.1 – 6.3	An Introduction to Factoring, Factoring Special Products, Factoring: Trial and Error ♦ Time Goal #1 – due Wednesday 9/4, 11:59 pm
9/10	6.4, 6.5	Factoring: The <i>ac</i> Method, Factoring Strategies ♦ Time Goal #2 – due Wednesday 9/11, 11:59 pm
9/17	6.6	Factoring and Problem Solving ♦ Time Goal #3 – due Wednesday 9/18, 11:59 pm
9/24	7.1	Roots and Radicals ♦ Time Goal #4 – due Wednesday 9/25, 11:59 pm ♦ <b>Objective Pie #1, Chapters 2, 6: due WEDNESDAY, 9/25, 11:59 pm</b> ♦ <b>Exam #1, Chapter 2 &amp; Chapter 6: Thursday 9/26</b>
10/1	7.2, 7.3	Simplifying Radical Expressions, Operations on Radicals ♦ Time Goal #5 – due Wednesday 10/2, 11:59 pm
10/8	7.4, 7.5	Solving Radical Equations, Rational Exponents ♦ Time Goal #6 – due Wednesday 10/9, 11:59 pm
10/15	7.6, 8.1	Complex Numbers, Solving Quadratic Equations ♦ Time Goal #7 – due Wednesday 10/16, 11:59 pm
10/22		<b>NO CLASS ON TUESDAY 10/22 – Reading Day!</b> <b>Added MAT 137 office hours: Tuesday 10/22: 1:00 – 3:00 pm</b> ♦ Time Goal #8 – due Wednesday 10/23, 11:59 pm ♦ <b>Objective Pie #2, Chapter 7: due WEDNESDAY, 10/23, 11:59 pm</b> ♦ <b>Exam #2, Chapter 7: Thursday 10/24</b>
10/29	8.2, 8.3	The Quadratic Formula, An Introduction to Parabolas ♦ Time Goal #9 – due Wednesday 10/30, 11:59 pm
11/5	8.4, 9.1	Quadratic Equations and Problem Solving, Simplifying Rational Expressions ♦ Time Goal #10 – due Wednesday 11/6, 11:59 pm
11/12	9.2	Multiplying and Dividing Rational Expressions ♦ Time Goal #11 – due Wednesday 11/13, 11:59 pm ♦ <b>Objective Pie #3, Chapter 8: due WEDNESDAY, 11/13, 11:59 pm</b> ♦ <b>Exam #3, Chapter 8: Thursday 11/14</b>
11/19	9.3, 9.6	Adding and Subtraction Rational Expressions, Rational Equations and Problem Solving ♦ Time Goal #12 – due Wednesday 11/20, 11:59 pm
11/26	10.4	Exponential Functions ♦ Time Goal #13 – due Wednesday 11/27, 11:59 pm <b>NO CLASS ON THURSDAY 11/28 – HAPPY THANKSGIVING!!</b>
12/3		Catch-up, Review ♦ Time Goal #14 – due Wednesday 12/4, 11:59 pm ♦ <b>Objective Pie #4, Chapter 9: due WEDNESDAY, 12/4, 11:59 pm</b> ♦ <b>Exam #4, Chapter 9, 10: Thursday 12/5</b>
12/10		♦ Time Goal #15 – due Wednesday 12/11, 11:59 pm ♦ <b>Objective Pie #5, Chapter 10: due WEDNESDAY, 12/11, 11:59 pm</b> ♦ <b>Full Pie due THURSDAY, 12/12, 12:30 pm</b> ♦ <b>FINAL EXAM – Thursday 12/12</b> <b>***2 hour final exam***</b>

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



# ALEKS<sup>®</sup> Course Syllabus

Course Name:	MAT 137 - Fall 2019	Course Code:	QWXJX-E3N3R
ALEKS Course:	Beginning and Intermediate Algebra Combined	Instructor:	Dr. Molkenthin
Course Dates:	Begin: 08/27/2019 End: 08/27/2020	Course Content:	381 Topics (236 goal + 145 prerequisite) / 344 accessible topics
Textbook:	Baratto/Bergman/Hutchison: Elementary and Intermediate Algebra, 5th Ed. (McGraw-Hill, Paperback) - ALEKS 360		

## Dates

## Objective








08/27/2019 - 09/25/2019	Ch.2-Functions and Graphs (13 topics)
08/27/2018 - 09/25/2019	Ch.6-Factoring (38 topics)
09/26/2019 - 10/23/2019	Ch.7-Radicals and Exponents (81 topics)
10/24/2019 - 11/13/2019	Ch.8-Quadratic Functions (30 topics)
11/14/2019 - 12/04/2019	Ch.9-Rational Expressions (71 topics)
12/05/2019 - 12/11/2019.	Ch.10-Exponential and Logarithmic Functions (5 topics)



Accessible Topic - Topics accessible to visually impaired students using a screen reader.

## Ch.2-Functions and Graphs (13 topics, due on 09/25/2019)

### Section 2.5 (8 topics)













- Identifying functions from relations
- Domain and range from ordered pairs 
- Table for a linear function 
- Evaluating functions: Linear and quadratic or cubic 
- Variable expressions as inputs of functions: Problem type 1 
- Finding outputs of a one-step function that models a real-world situation: Function notation 
- Finding outputs of a two-step function with decimals that models a real-world situation: Function notation 
- Finding inputs and outputs of a two-step function that models a real-world situation: Function notation 

## Section 2.6 (5 topics)










- Vertical line test
- 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

## Ch.6-Factoring (38 topics, due on 09/25/2019)








### Section 6.1 (12 topics)

- Greatest common factor of 2 numbers 
- Factoring a linear binomial 
- Introduction to the GCF of two monomials 
- Greatest common factor of three univariate monomials 
- Greatest common factor of two multivariate monomials 
- Factoring out a monomial from a polynomial: Univariate 
- Factoring out a monomial from a polynomial: Multivariate 
- Factoring out a binomial from a polynomial: GCF factoring, basic 
- Factoring a univariate polynomial by grouping: Problem type 1 
- Factoring a univariate polynomial by grouping: Problem type 2 
- Factoring a multivariate polynomial by grouping: Problem type 1 
- Factoring a multivariate polynomial by grouping: Problem type 2 

### Section 6.2 (9 topics)

- Factoring a perfect square trinomial with leading coefficient 1 
- Factoring a perfect square trinomial with leading coefficient greater than 1 
- Factoring a perfect square trinomial in two variables 
- Factoring a difference of squares in one variable: Basic 
- Factoring a difference of squares in one variable: Advanced 
- Factoring a difference of squares in two variables 
- Factoring a polynomial involving a GCF and a difference of squares: Univariate 
- Factoring a polynomial involving a GCF and a difference of squares: Multivariate 
- Factoring a sum or difference of two cubes 

### Section 6.3 (7 topics\*)

- Factoring a quadratic with leading coefficient 1 
- Factoring a quadratic in two variables with leading coefficient 1 
- Factoring out a constant before factoring a quadratic 
- Factoring a quadratic with a negative leading coefficient 
- Factoring a perfect square trinomial with leading coefficient 1 
- Factoring a perfect square trinomial with leading coefficient greater than 1 
- Factoring a perfect square trinomial in two variables 

## Section 6.4 (12 topics\*)

- Factoring a quadratic with leading coefficient 1
- Factoring a quadratic in two variables with leading coefficient 1
- Factoring out a constant before factoring a quadratic
- Factoring a quadratic with leading coefficient greater than 1: Problem type 1
- Factoring a quadratic with leading coefficient greater than 1: Problem type 2
- Factoring a quadratic by the ac-method
- Factoring a quadratic in two variables with leading coefficient greater than 1
- Factoring a quadratic with a negative leading coefficient
- Factoring a perfect square trinomial with leading coefficient 1
- Factoring a perfect square trinomial with leading coefficient greater than 1
- Factoring a perfect square trinomial in two variables
- Factoring a product of a quadratic trinomial and a monomial

## Section 6.5 (21 topics\*)

- Factoring out a monomial from a polynomial: Univariate
- Factoring out a monomial from a polynomial: Multivariate
- Factoring a univariate polynomial by grouping: Problem type 2
- Factoring a multivariate polynomial by grouping: Problem type 1
- Factoring a quadratic with leading coefficient 1
- Factoring a quadratic in two variables with leading coefficient 1
- Factoring out a constant before factoring a quadratic
- Factoring a quadratic with leading coefficient greater than 1: Problem type 1
- Factoring a quadratic with leading coefficient greater than 1: Problem type 2
- Factoring a quadratic in two variables with leading coefficient greater than 1
- Factoring a quadratic with a negative leading coefficient
- Factoring a perfect square trinomial with leading coefficient 1
- Factoring a perfect square trinomial with leading coefficient greater than 1
- Factoring a perfect square trinomial in two variables
- Factoring a difference of squares in one variable: Advanced
- Factoring a difference of squares in two variables
- Factoring a polynomial involving a GCF and a difference of squares: Univariate
- Factoring a polynomial involving a GCF and a difference of squares: Multivariate
- Factoring a product of a quadratic trinomial and a monomial
- Factoring with repeated use of the difference of squares formula
- Factoring a sum or difference of two cubes













## Section 6.6 (7 topics)

- Solving an equation written in factored form
- Finding the roots of a quadratic equation of the form  $ax^2 + bx = 0$
- 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 quadratic equation needing simplification
- Solving a word problem using a quadratic equation with rational roots
- Writing a quadratic equation given the roots and the leading coefficient


















(\*) Some topics in this section are also covered in a previous section of this Objective.  
Topics are only counted once towards the total number of topics for this Objective.

## Ch.7-Radicals and Exponents (81 topics, due on 10/23/2019)







### Section 7.1 (14 topics)

- Square root of a perfect square 
- Using a calculator to approximate a square root 
- Introduction to the Pythagorean Theorem 
- Pythagorean Theorem 
- Word problem involving the Pythagorean Theorem 
- Square root of a rational perfect square 
- Square roots of integers raised to even exponents
- Introduction to simplifying a radical expression with an even exponent 
- Square root of a perfect square monomial 
- Cube root of an integer 
- Finding  $n^{\text{th}}$  roots of perfect  $n^{\text{th}}$  powers with signs 
- Finding the  $n^{\text{th}}$  root of a perfect  $n^{\text{th}}$  power fraction
- Word problem involving radical equations: Basic 
- Distance between two points in the plane: Exact answers 

### Section 7.2 (18 topics\*)

- Finding the  $n^{\text{th}}$  root of a perfect  $n^{\text{th}}$  power monomial 
- Simplifying the square root of a whole number less than 100 
- Simplifying the square root of a whole number greater than 100 
- Simplifying a radical expression with an even exponent 
- Introduction to simplifying a radical expression with an odd exponent
- Simplifying a radical expression with an odd exponent 
- Simplifying a radical expression with two variables 
- Simplifying a higher root of a whole number 
- Introduction to simplifying a higher radical expression 
- Simplifying a higher radical expression: Univariate 
- Simplifying a higher radical expression: Multivariate 
- Simplifying a quotient of square roots 
- Rationalizing a denominator: Quotient involving square roots 
- Rationalizing a denominator: Square root of a fraction 
- Rationalizing a denominator: Quotient involving a monomial 
- Rationalizing a denominator: Quotient involving a higher radical 
- Rationalizing a denominator: Quotient involving higher radicals and monomials 
- Distance between two points in the plane: Exact answers 

### Section 7.3 (24 topics\*)

- Introduction to square root addition or subtraction 
- Square root addition or subtraction 
- Square root addition or subtraction with three terms 
- Introduction to simplifying a sum or difference of radical expressions: Univariate 
- Simplifying a sum or difference of radical expressions: Univariate 
- Simplifying a sum or difference of higher roots 

- Simplifying a sum or difference of higher radical expressions
- Introduction to square root multiplication
- Square root multiplication: Basic
- Square root multiplication: Advanced
- Introduction to simplifying a product of radical expressions: Univariate
- Simplifying a product of radical expressions: Univariate
- Simplifying a product of radical expressions: Multivariate
- Introduction to simplifying a product of higher roots
- Simplifying a product of higher radical expressions
- Introduction to simplifying a product involving square roots using the distributive property
- Simplifying a product involving square roots using the distributive property: Basic
- Simplifying a product involving square roots using the distributive property: Advanced
- Special products of radical expressions: Conjugates and squaring
- Simplifying a quotient involving a sum or difference with a square root
- Rationalizing a denominator: Quotient involving square roots
- Rationalizing a denominator using conjugates: Integer numerator
- Rationalizing a denominator using conjugates: Square root in numerator
- Rationalizing a denominator using conjugates: Variable in denominator







#### Section 7.4 (12 topics\*)

- Introduction to solving a radical equation
- Solving a radical equation that simplifies to a linear equation: One radical, basic
- 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 with a quadratic expression under the radical
- Solving a radical equation that simplifies to a quadratic equation: Two radicals
- Algebraic symbol manipulation with radicals
- Word problem involving radical equations: Basic
- Word problem involving radical equations: Advanced
- Solving an equation with a root index greater than 2: Problem type 1

#### Section 7.5 (10 topics)

- Converting between radical form and exponent form
- Rational exponents: Unit fraction exponents and whole number bases
- Rational exponents: Unit fraction exponents and bases involving signs
- Rational exponents: Non-unit fraction exponent with a whole number base
- Rational exponents: Negative exponents and fractional bases
- Rational exponents: Product rule
- Rational exponents: Quotient rule
- Rational exponents: Products and quotients with negative exponents
- Rational exponents: Power of a power rule
- Rational exponents: Powers of powers with negative exponents








## Section 7.6 (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  $i$  







(\*) Some topics in this section are also covered in a previous section of this Objective.  
Topics are only counted once towards the total number of topics for this Objective.

## Ch.8-Quadratic Functions (30 topics, due on 11/13/2019)



### Section 8.1 (7 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 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 

### Section 8.2 (6 topics)

- Using the Pythagorean Theorem and a quadratic equation to find side lengths of a right triangle 
- 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 

### Section 8.3 (11 topics)

- Graphing a parabola of the form  $y = ax^2$
- Graphing a parabola of the form  $y = ax^2 + c$
- Graphing a function of the form  $f(x) = ax^2$
- Graphing a function of the form  $f(x) = ax^2 + c$
- Finding the vertex, intercepts, and axis of symmetry from the graph of a parabola
- Graphing a parabola of the form  $y = (x-h)^2 + k$
- Graphing a parabola of the form  $y = x^2 + bx + c$
- Graphing a parabola of the form  $y = ax^2 + bx + c$ : Integer coefficients
- Finding the x-intercept(s) and the vertex of a parabola 
- Classifying the graph of a function
- Midpoint of a line segment in the plane 

## Section 8.4 (6 topics)

- Solving an equation with exponent  $1/a$ : Problem type 1
- Solving an equation that can be written in quadratic form: Problem type 1
- Solving an equation that can be written in quadratic form: Problem type 2
- Finding the maximum or minimum of a quadratic function
- Word problem involving the maximum or minimum of a quadratic function
- Solving a quadratic equation by graphing

## Ch.9-Rational Expressions (71 topics, due on 12/04/2019)

### Section 9.1 (15 topics)























- Simplifying a ratio of multivariate monomials: Basic
- Simplifying a ratio of univariate monomials
- Quotient of expressions involving exponents
- Simplifying a ratio of multivariate monomials: Advanced
- Restriction on a variable in a denominator: Linear
- Restriction on a variable in a denominator: Quadratic
- Evaluating a rational function: Problem type 1
- Evaluating a rational function: Problem type 2
- Domain of a rational function: Excluded values
- Simplifying a ratio of factored polynomials: Linear factors
- Simplifying a ratio of polynomials using GCF factoring
- Simplifying a ratio of linear polynomials: 1, -1, and no simplification
- Simplifying a ratio of polynomials by factoring a quadratic with leading coefficient 1
- Simplifying a ratio of polynomials: Problem type 1
- Simplifying a ratio of polynomials: Problem type 2

### Section 9.2 (10 topics)



















- Multiplying rational expressions involving multivariate monomials
- Multiplying rational expressions made up of linear expressions
- Multiplying rational expressions involving quadratics with leading coefficients of 1
- Multiplying rational expressions involving quadratics with leading coefficients greater than 1
- Multiplying rational expressions involving multivariate quadratics
- Dividing rational expressions involving multivariate monomials
- Dividing rational expressions involving linear expressions
- Dividing rational expressions involving quadratics with leading coefficients of 1
- Dividing rational expressions involving quadratics with leading coefficients greater than 1
- Dividing rational expressions involving multivariate quadratics









### Section 9.3 (22 topics)

- Finding the LCD of rational expressions with linear denominators: Relatively prime 
- Finding the LCD of rational expressions with linear denominators: Common factors 
- Finding the LCD of rational expressions with quadratic denominators 
- Writing equivalent rational expressions with monomial denominators 
- Writing equivalent rational expressions with polynomial denominators 
- Writing equivalent rational expressions involving opposite factors 
- Introduction to adding fractions with variables and common denominators 
- Adding rational expressions with common denominators and monomial numerators 
- Adding rational expressions with common denominators and binomial numerators 
- Adding rational expressions with common denominators and GCF factoring 
- Adding rational expressions with common denominators and quadratic factoring 
- Adding rational expressions with different denominators and a single occurrence of a variable 
- Adding rational expressions with denominators  $ax$  and  $bx$ : Basic 
- Adding rational expressions with denominators  $ax$  and  $bx$ : Advanced 
- Adding rational expressions with denominators  $ax^n$  and  $bx^m$  
- Adding rational expressions with multivariate monomial denominators: Basic 
- Adding rational expressions with linear denominators without common factors: Basic 
- Adding rational expressions with linear denominators without common factors: Advanced 
- Adding rational expressions with linear denominators with common factors: Basic 
- Adding rational expressions with denominators  $ax-b$  and  $b-ax$  
- Adding rational expressions involving different quadratic denominators 
- Adding 3 rational expressions with different quadratic denominators 

### Section 9.6 (24 topics)



- Solving a word problem on proportions using a unit rate 
- Solving a linear equation with several occurrences of the variable: Fractional forms with monomial numerators 
- Solving a proportion of the form  $x/a = b/c$  
- Solving a proportion of the form  $(x+a)/b = c/d$  
- Solving a proportion of the form  $a/(x+b) = c/x$  
- Solving a rational equation that simplifies to linear: Denominator  $x$  
- Solving a rational equation that simplifies to linear: Denominator  $x+a$  
- Solving a rational equation that simplifies to linear: Denominators  $a$ ,  $x$ , or  $ax$  
- Solving a rational equation that simplifies to linear: Denominators  $ax$  and  $bx$  
- 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: Proportional form, basic 
- Solving a rational equation that simplifies to quadratic: Denominator  $x$  
- 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 
- Solving a rational equation that simplifies to quadratic: Proportional form, advanced 




- Solving for a variable in terms of other variables in a rational equation: Problem type 1 
- Solving for a variable in terms of other variables in a rational equation: Problem type 2 
- Solving for a variable in terms of other variables in a rational equation: Problem type 3 
- Word problem on proportions: Problem type 1 
- Solving a work problem using a rational equation 
- Solving a distance, rate, time problem using a rational equation 

## **Ch.10-Exponential and Logarithmic Functions (5 topics, due on 12/11/2019)**

### Section 10.4 (5 topics)

- Table for an exponential function 
- Graphing an exponential function:  $f(x) = a^x$
- Graphing an exponential function:  $f(x) = a(b)^x$
- Graphing an exponential function and its asymptote:  $f(x) = a(b)^x$
- Solving an exponential equation by finding common bases: Linear exponents 

### Section 10.7 (1 topic\*)

- Solving an exponential equation by finding common bases: Linear exponents 

(\*) Some topics in this section are also covered in a previous section of this Objective.  
Topics are only counted once towards the total number of topics for this Objective.