

# UNIVERSITY OF FLORIDA

## MAC 1147 - FALL 2015

### CALENDAR / SYLLABUS as of 8/17/15

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The course home page is located in Sakai. Log in at <https://lss.at.ufl.edu>.

You can send a message to one of your instructors by going to the Mail tool in Sakai, selecting "Compose a new message", then scroll down past the sections and highlight the name.

#### Course Coordinator

Sherry Tornwall

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Office Hours: M6, M7, W4, W5, F4

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Email: [tornwall@ufl.edu](mailto:tornwall@ufl.edu) (please use the Sakai)

#### Teaching Assistants

See Sakai MAC 1147 Course Materials tab for information.

TA \_\_\_\_\_

Office \_\_\_\_\_

Office Hours \_\_\_\_\_

Email: \_\_\_\_\_

**FALL 2015 –MAC1147 Calendar** (as of 7/24/15)

Test 1\* (L1-L8)–September 15, Tuesday, 8:30-10 pm

Test 2\* (L9-L17) –October 8, Thursday, 8:30-10 pm

Test 3\* (L18-25)–October 29, Thursday, 8:30-10 pm

Test 4\* (L26-L33) –December 3, Thursday, 8:30-10 pm

Cumulative Final\* (L1-L36)– December 15, Tuesday, 3:00 pm

\*See Sakai for test locations.

Note: HW = Book HW and WebAssign HW.

	Monday	Tuesday	Wednesday	Thursday	Friday
<b>August</b>	24 L1, HW1	25 First discussion class	26 L2, HW2	27 First discussion class	28 L3, HW3
<b>September</b>	31 L4, HW4	1 DQ 1 (L1-L3)	2 L5, HW5	3 DQ 1 (L1-L4)	4 L6, HW6 WA Q1 due 10 pm
	7 Labor Day no class	8 DQ2 (L4-L6)	9 L7, HW7 Sakai intro quizzes due 10 pm	10 DQ 2 (L5-L6)	11 L8, HW8 WA Q2 due 10 pm
	14 Review L1-L8	15 DQ 3 (L7-L8) <b>Test 1 tonight</b>	16 L9, HW9	17 HW 1 (L1-L8)	18 L10, HW10 WA Q3 due 10 pm
	21 L11, HW11	22 Disc Class HW 1 (L1-L8)	23 L12, HW12	24 DQ 3 (L9-11)	25 L13, HW13 WA Q4 due 10 pm
	28 L14, HW14	29 DQ 4 (L9-L13)	30 L15, HW15	1 DQ 4 (L12-L14)	2 L16, HW16 WA Q5 due 10 pm
<b>October</b>	5 L17, HW17	6 DQ5 (L14-L16)	7 Review L9-L17	8 DQ 5 (L15-L17) <b>Test 2 tonight</b>	9 L18, HW18 WA Q6 due 10 pm
	12 L19, HW19	13 Disc Class HW 2 (L9-L17)	14 L20, HW20	15 Disc Class HW 2 (L9-L17)	16 L21, HW21 WA Q7 due 10 pm
	19 L22, HW22	20 DQ 6 (L18-L21)	21 L23, HW23	22 DQ 6 (L18-22)	23 L24, HW24 WA Q8 due 10 pm
	26 L25, HW25 <b>Sakai Self-eval due 10 pm</b>	27 DQ 7 (L22-L24)	28 Review 3 L18-L25	29 DQ 7(L23-L25) <b>Test 3 tonight</b>	30 L26, HW26 WA Q9 due 10 pm
<b>November</b>	2 L27, HW27	3 Disc Class HW 3 (L18-L25)	4 L28, HW28	5 Disc Class HW 3 (L18-L25)	6 HC - No class. WA Q10 due 10 pm
	9 L29, HW29	10 DQ 8 (L25-L28)	11 Veterans' Day no class.	12 DQ 8 (L26-L29)	13 L30, HW30 WA Q11 due 10 pm
	16 L31, HW31	17 DQ 9 (L29-L30)	18 L32, HW32	19 DQ 9 (L30-L31)	20 L33, HW33 WA Q12 due 10 pm
	23 L34, HW34 Last day to drop/withdraw	24 DQ 10 (L31-L33)	25 No class	26 Thanksgiving No class	27 No class WA Q13 due 10 pm
<b>December</b>	30 Review 4 L26-L33	1 DQ 10 (attendance) WA bonus L34	2 L35, HW35	3 DQ 10 (attendance) <b>Test 4 tonight</b>	4 L36, HW36
	7 Review final L1-L36 WA bonus L35	8 No disc class. WA bonus L36	9 Review final L1-L36	10 <b>No class</b> Reading Day	11 <b>No class</b> Reading Day

**Cumulative final is December 15, Tuesday at 3:00 p.m.** Final grades are available on ISIS on Dec 23.

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## 1. Introduction

### 1a. Course Content

College algebra, functions, coordinate geometry, exponential and logarithmic functions, and trigonometry. This **fast-paced course** is designed as a review of algebra and trigonometry to prepare the student for calculus.

A minimum grade of C (not C-) in MAC 1147 satisfies four hours of the general education requirement and also satisfies the pure math portion of the state Writing/Math requirement. Note: A student can receive at most four credits for taking both MAC 1147, and MAC 1140 or MAC 1114, and at most five credit hours for taking MAC 1147, MAC 1140, and MAC 1114. Students who successfully complete this course (C or better) can advance directly to MAC 2311, Calculus 1 (for engineers and scientists), or into MAC 2233, Survey of Calculus.

If your goal is to take MAC 2233, Survey of Calculus (for business majors), then you might want to talk to your advisor about taking MAC 1140, Precalculus Algebra, instead of this course (which includes trigonometry) since there is no trigonometry requirement for MAC 2233.

Students taking this course for general education credit or the pure math portion of the Writing/Math requirement, and who do not need precalculus for their major or as preparation for calculus, might consider taking MGF 1106 or MAC 1105. For more information on math courses and math advisors go to <http://www.math.ufl.edu/>.

### 1b. Prerequisites

This course assumes prior knowledge of intermediate algebra (Algebra 2) and trigonometry. Students should be able to do arithmetic without a calculator.

MAC 1147 begins with a short review of high school algebra topics (appendices A1 – A7). **You should already be competent in working this material.**

### 1c. Required Materials

- ❖ The textbook: **PRECALCULUS**, 9<sup>th</sup> edition, by Larson.
  - You may use either the e-book or a hard copy.
  - The solutions manual is NOT required.
- ❖ A valid WebAssign access code.
  - WebAssign provides a two-week grace period to use the online homework system before you must purchase an access code.
  - You should always use <https://www.webassign.net/ufl/login.html> to login to WebAssign (and then your Gatorlink login info as directed). Click on the **login** on the **left** side.

### **There are several purchase options:**

- Purchase the textbook and WebAssign access codes together directly from the publisher at <http://www.cengagebrain.com/course/1-1Z09XE5> \$95 for the custom UF paperback book, access to the e-book, and a WebAssign access code; or
- \$50 for access to the e-book and a WebAssign access code.
- ❖ Purchase the textbook and/or WebAssign access code at a bookstore or elsewhere.
  - Either the UF custom 9<sup>th</sup> edition or the complete 9<sup>th</sup> edition may be used. If you purchase a new textbook, a WebAssign access code might (or might not) come with it, so please be aware.
  - Purchase a WebAssign access code directly from WebAssign.
  - Prices may vary.
- ❖ Copies of the book and the solutions manual are also available for in-library use at the reserve desk at UF Smathers Library West and the Marston Science Library.

### **1d. E-Learning Sakai**

Sakai is located at <https://lss.at.ufl.edu> ; use your Gatorlink username and password to login. You can find your grades, announcements, lecture outlines, free help information, etc., at this site. You are responsible for verifying that your grades are accurate. You have one week after a score has been posted to contact your TA if you believe there has been a grading or a recording error.

### **1e. Lectures**

The lecture presentations are an important aspect of the learning process. The lecture provides the main presentation of the course material. You are responsible for learning the material missed due to an absence. After each lecture the completed notes will be available on the door of Little 374. Lecture outlines can be printed from Sakai. It is suggested that you read the book, attend lecture or watch the pre-taped video, do the corresponding book homework and the WebAssign Homework, and then take the WebAssign Quiz. The WebAssign quizzes and WebAssign homework are generally due on Fridays (see WebAssign for actual dates), but it is recommended that you take them earlier.

You may print the lecture outlines which can be found on Sakai under Course Materials or you can purchase them at Target copy Center at 1412 West University Avenue for about \$18.

## 1f. Calculator Policy

A calculator may be used on WebAssign homeworks and WebAssign quizzes, but NOT on discussion quizzes and exams.

## 1g. Discussion Sections

Discussion sections meet once a week (either Tuesday or Thursday, depending on the section in which you are registered) give you a valuable opportunity for open discussion of the lecture material and assigned problems in a smaller class setting. A significant portion of the points that determine your grade are earned in discussion class. If necessary, twice during the semester you may attend a different period of your TA's discussion class. Go to [www.math.ufl.edu/courses](http://www.math.ufl.edu/courses) to see when and where your TA teaches.

Your main resource person is your discussion leader, a teaching assistant (TA) in the mathematics department. He or she is available during office hours (or by appointment) to answer your questions about the course material. Your TA is responsible for grading/recording your discussion quizzes, homework, free response on tests, and lecture participations. You must retain all returned papers in case of any discrepancy with your course grade. As mentioned above, **you should check Sakai regularly and consult with your discussion leader if you have any questions about recorded grades. All grade concerns must be taken care of within one week of receiving the score.** Your grade is subject to being raised or lowered if there is a recording error, computational error, bubbling error, "padding" error, etc.

If you have concerns about your discussion class which cannot be handled by your TA, please contact the course coordinator, Mrs. Tornwall, in Little 374, [tornwall@ufl.edu](mailto:tornwall@ufl.edu) (use Sakai email tool).

## 1h. Help (free)

- ◆ Your main resource person is your teaching assistant (TA) in the mathematics department. He or she is available during office hours to answer your questions about the course material. You may also contact the course coordinator, Mrs. Tornwall, during her office hours for help or **any** of the MAC 1147 TAs.
- ◆ **In addition to attending your discussion section regularly and visiting any MAC1147 discussion leader, lecturer, or the course coordinator**, during their office hours, the following aids are available.
  - ◆ The Teaching Center Math Lab, located at SE Broward Hall, offers free informal tutoring. You may want to attend different hours to find the tutors with whom you feel most comfortable. Go to

[www.teachingcenter.ufl.edu](http://www.teachingcenter.ufl.edu) to find their hours. You can also request free one-on-one tutoring.

- ◆ Supplemental Instructor (SI) is provided by the Teaching Center. Check your tab bar on Sakai's home page for a link to the SI.
- ◆ Solutions, interactivity, videos, and tutorial help is available for free at [www.LarsonPrecalculus.com](http://www.LarsonPrecalculus.com).
- ◆ Textbooks and solutions manuals are located at the reserve desk at the Marston Science Library and Smathers Library West.
- ◆ Private Tutors: If after availing yourself of these aids, you feel you need more help, you may obtain a list of qualified tutors for hire at [www.math.ufl.edu](http://www.math.ufl.edu). Search "tutors".
- ◆ The Counseling Center has some informative information on developing math confidence. Go to <http://www.counseling.ufl.edu/cwc/Developing-Math-Confidence.aspx> for information on math confidence and information on joining the Academic Confidence Group
- ◆ Contact information for the Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc/Default.aspx>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

## 1i. Success

Success in MAC 1147 depends largely on your attitude and effort. Keeping up with the material is critical. Most students find it beneficial to work daily on the material as opposed to saving it all for one day. It is not effective to sit and copy notes without following the thought processes involved in the lecture. For example, you should try to answer the questions posed by the lecturer. Students who actively participate have greater success.

Be aware that much of the learning of mathematics at the university level takes place outside of the classroom. You need to spend time reviewing the concepts of each lecture **before** you attempt homework problems. It is also important to spend some time looking over the textbook sections to be covered in the next lecture to become familiar with the vocabulary and main ideas beforehand so that you will be better able to grasp the material presented in lecture. **You should expect to spend at least 12 hours per week working on this course – four in class hours and eight hours outside of class.**

It can also be very helpful to study with a group. This type of cooperative learning is encouraged, but be sure it leads to a better conceptual understanding. **You must be able to work through the problems on your own.** Even if you work together,

**each student must turn in his or her own work, not a copied solution, on any collected individual assignments.**

### **1j. Students with Disabilities**

Students requesting classroom accommodation must first register with the Disability Resource Center (DRC). The DRC will provide documentation to the student who must then provide this documentation to the course coordinator, Mrs. Tornwall, Little 374, when requesting accommodation.

### **1k. Academic Honesty**

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

## **2. Testing**

The first four exams are at 8:30 p.m. See the course calendar for the dates. The cumulative final is during finals week. Room locations will be posted on Sakai prior to the exams

- ◆ Students are responsible for material covered in the lecture notes, including practice problems at the end of some lectures, all assigned book homework problems, and all assigned WebAssign material.
- ◆ There are sample exams under the Course Materials link on Sakai. Also, sample exams are available from the Teaching Center one week prior to the exam.
- ◆ You should bring to each test only\* the following:
  - Your UF Gator One Card.
  - Soft lead pencils.
  - Knowledge of your section number.

\*It is suggested that you do not bring anything of value to the test since you are not allowed to take items such as backpacks to your seat.



- ◆ **NO CALCULATORS ARE PERMITTED.** All electronic devices must be put away. This includes phones. Scratch paper will be provided.
- ◆ The Test Form Code, as well as **your UF ID**, and name must be encoded correctly or you will **lose points**. You must also take the test in your assigned test location or you will lose points on your test.
- ◆ No one will be admitted to the test 30 minutes after the starting time of the test. No one will be permitted to leave the test until 30 minutes after the stated start time.

### 3. Grading

#### 3a. Course Grade

The course is based on 500 points accumulated as follows:

Web Tour (in Sakai)	1 point (0.2%)
Calendar and Syllabus Quiz (in Sakai)	2 points (0.4%)
Contract (in Sakai)	1 point (0.2%)
Self-evaluation (in Sakai)	1 point (0.2%)
Book HWs (3@10 pts, for a max of 20 pts)	20 points (4%)
Discussion Quizzes (best 8 of 10 @ 10 pts)	80 points (16%)
Online WA HWs (33 @ 1 pt, max. of 30)	30 points (6%)
Online WA Quizzes (best 10 of 13 @ 2 pts)	20 points (4%)
Exams (best 3 of 4 @ 80 pts)	240 points (48%)
Cumulative Final Exam	105 points (21%)

Add your bonus points, then use the scale below to determine your final letter grade. The **course grade is determined by the number of points** you have, **not by the percentage**, and will be strictly enforced.

A = 450-500 points (90%)

A - = 435-449 points (87%)

B+ = 420-434 points (84%)

B = 400-419 points (80%)

B - = 385-399 points (77%)

C+ = 370-384 points (74%)

C = 350-369 points (70%)

C- = 335-349 points (67%)

D+ = 320-334 points (64%)

For information on dropping courses and withdrawals go to  
<https://catalog.ufl.edu/ugrad/current/regulations/info/drops.aspx#drop>

D = 300-319 points (60%)      For information about UF grades and grading policies go to  
D- = 285-299 points (57%)      <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>  
E = below 285 points

### 3b. Course Introduction Quizzes

The Web Tour Quiz, the Calendar/Syllabus Quiz, and the Contract are to make sure you understand what is expected of you in this course. You will find these assignments on Sakai under the Assessment tool. They are due at the beginning of the semester.

### 3c. Self-evaluation

The Self-evaluation which is found in Sakai is after Exam 2. Its purpose is to let you know your approximate standing in the class. See the calendar for the due date.

### 3d. Textbook Homework

The text assignments on page 13 represent the minimum number of problems you should do in each section and serve as a basis for your questions in your discussion section. Homework must be done neatly and work must be shown for credit. You do not need to copy the problem from the book. Homework will be checked for completeness and a few problems will be graded for accuracy. The work should be your own and not copied from the solutions manual. Homework will be collected three times during the semester. See the calendar for collection dates. Some homework problems suggest the use of a graphing calculator. These are designed to help you visualize important concepts and to reinforce the mathematical processes involved. The use of a calculator when doing homework is not required.

**Calculators are not permitted on quizzes or tests.**

### 3e. Discussion Class Quizzes

These will be administered in the discussion section the last 10-15 minutes of class by your discussion leader. Quizzes will be based on the previous lectures and homework assignments. See the calendar for more information. If you feel there is a grading error or posting error on Sakai, you must discuss it with your TA within one week. No aids may be used on the discussion quiz.

### 3f. WebAssign Homeworks and Quizzes

If you purchased a new book, the WebAssign access code probably came with the book. If you did not purchase a new book then you will need to purchase the access code. See section 1c for information on purchasing the access code.

To access WebAssign go to <http://webassign.net/ufl/login.html> (You must use this full url.) and use your Gatorlink login and password. Click on the login on the **left** side. If you have previously purchased the access code you will now enter it. If you

have not yet purchased the access code, you can use the free grace period for the first few weeks.

You must score a minimum of 70% on the WebAssign Homeworks before you can take the corresponding WebAssign Quiz. You have 10 attempts and unlimited time on each WebAssign Homework. You have three attempts and one hour on each WebAssign Quiz. The WebAssign Homeworks and Quizzes are generally due by 10:00 p.m. on Fridays. See WebAssign for the specific due dates.

**DO NOT wait until the last minute to take a quiz, since if you encounter a computer glitch or if WebAssign is down, YOU will be out of luck!**

The best attempt for each WebAssign quiz and homework is the score that is counted. The WebAssign homeworks and quizzes are open-book and open-note. You may have someone help you with the WebAssign homeworks, but NOT with the quizzes.

If you feel your answer is correct, but WebAssign marks it wrong, see your TA.

For questions on how to use WebAssign contact WebAssign Support or post on the Sakai Discussion Forum for help from your classmates. Often just using a different browser solves the problem.

### 3g. Lecture Participation and/or Video Bonus Points

There are eight bonus points available for either attending lecture or watching the pre-taped videos by the due date. You may choose to earn your bonus points by attending the live lectures, watching the pre-taped videos, or a combination of the two. However, you may earn a maximum of only eight bonus points.

Lecture Participation points will be given in lecture four times during the semester. They are worth two points which will be added to your total points. You may use your book, your notes, work in groups, or get help from the lecturer. To receive credit you must put your TA's name and your section number on your paper. There are no make-ups.

Video bonus points are earned by watching the videos and answering the check point questions before the due date. The bonus questions are found on Sakai. The due dates are 10 pm the day of the live lecture.

### 3h. Make-up Policies

All make-up work must be completed by Monday, December 7 at noon.

- ◆ **Exams** - If you have a conflict due to a UF sponsored event or an assembly exam in another course, you need to bring your documentation to Mrs. Tornwall in Little 374 at least one week (otherwise 5 point penalty) before the exam to sign up for the make-up which will be given within one week of the test date. If you miss for any other reason you must notify Mrs. Tornwall within a week of the exam (otherwise 5 point penalty). To be eligible for this

make-up you must have received at least half of the lecture participation/or video bonus points that have been given so far and must receive at least half of the total points by the end of the semester. There is a 10 point penalty for missing the final due to negligence.

**If other classes are scheduled during the exam time**, University policy states that the assembly exam takes precedence over the evening class and the evening class instructor must provide make-up work and cannot penalize students who miss because of an assembly exam.

- ◆ **Discussion quizzes** - There are no make-ups , unless, a) you are participating in a UF sponsored event, for which you must bring your documentation at least one week prior to Mrs. Tornwall. b) you miss at least three discussion quizzes for which you have valid, documentable reasons for your absences. You will be allowed to make up the excused absences that are in excess of two. To be eligible for a make-up you must have received credit for at least half of the lecture participation points. Bring your documentation to Mrs. Tornwall in Little 374 within one week of your third discussion quiz absence. c) you miss because of a religious holiday. You must notify Mrs. Tornwall within the first three weeks of class if you will be missing discussion class due to a religious holiday. d) you miss because of a court-ordered obligation – see Mrs. Tornwall.
- ◆ **Homework collection** – There are no make-ups, unless you are participating in a UF sponsored event. In this case you must bring your HW to your TA prior to the collection day along with your documentation.  
  
If you are not able to be in discussion class that day, you can turn your HW in early to your TA or have someone take it to class for you. You must turn in ALL the HW from the lectures that were on the test. There is a two-point penalty for not being in discussion class.
- ◆ **WebAssign, Lecture Participation** - There are no make-ups.

### 3i. Incomplete

Incomplete Grade

A grade of I (incomplete) will be considered only if you meet the Math Department criteria which are found at <http://www.math.ufl.edu/>. If you meet the criteria you must contact Mrs. Tornwall before finals week to be considered for an I. An I only allows you to make up your incomplete work, not redo your work.

## 4. Instructor Evaluations

Students are asked to provide feedback on the quality of instruction in this course based on ten criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or

three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.

## 5. Textbook Homework Assignments

You should read the textbook sections covered in each lecture before coming to lecture. After each lecture, review your notes and the text to make sure you understand the main ideas prior to working the exercises.

If you have questions about the reading or homework exercises, you may ask your TA (or the course coordinator during office hours).

You should complete each assignment before the next lecture, since the material in each lecture often builds on previous concepts.

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### L1 Real Numbers

Reading: Student Guide, Appendix A.1

Exercises (A.1), page A11: 6, 7, 9, 12, 16, 17, 19, 25, 27, 35, 39, 40, 43, 50, 53, 55, 61, 65, 72, 73, 80

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### L2 Exponents and Radicals

Reading: Appendix A.2

Exercises (A.2), page A23: 1, 4, 6, 7, 8, 13, 14, 19, 20, 26, 29, 41, 44, 50, 52, 56, 58, 60, 62, 64, 65, 72, 74, 75, 78, 81, 84

Additional exercise: Simplify the radical expression  $\sqrt[3]{81x^7y^2} \cdot \sqrt[3]{36x^2y^2}$ .

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### L3 Polynomials and Factoring

Reading: Appendix A.3

Exercises (A.3), page A33: 1, 2, 15, 19, 21, 23, 33, 35, 37, 39, 43, 45, 47, 52, 56, 61, 69, 76, 79, 89, 94, 103, 104, 107

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### L4 Rational Expressions

Reading: Appendix A.4

Exercises (A.4), page A42: 1, 2, 3, 4, 7, 12, 16, 22, 30, 35, 39, 44, 51, 54, 56, 60, 62, 66, 70, 78, 79, 81, 82

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## L5 Solving Equations

Reading: Appendix A.5

Exercises (A.5), page A56: 1, 3, 4, 10, 14, 19, 21, 26, 34, 38, 40, 42, 44, 50, 63, 70, 76, 78, 80, 84, 85, 86, 90, 92, 95, 100

Additional exercises: Find all real solutions and check your answers.

1.  $6x^{-2} + x^{-1} = 2$

2.  $8(m - 4)^4 - 10(m - 4)^2 + 3 = 0$

3.  $(y + 3)^{2/3} - 2(y + 3)^{1/3} - 3 = 0$

4.  $4(x + 1)^{1/2} - 5(x + 1)^{3/2} + (x + 1)^{5/2} = 0$

5.  $\frac{1}{x - 3} + \frac{3}{x + 3} = \frac{6x}{x^2 - 9}$

6.  $\frac{x^2 - 9}{x^2 - 2x - 3} = \frac{3}{2}$

7.  $x^8 - 4x^4 - 5 = 0$

8.  $3x^4 + 10x^2 - 25 = 0$

9.  $\sqrt{x + 7} + 3 = \sqrt{x - 4}$

10.  $2x = 1 - \sqrt{2 - x}$

11.  $x = \sqrt{15 - 2x}$

12.  $(5x^2 - 6)^{1/4} = x$

13.  $\sqrt[3]{4x + 3} = \sqrt[3]{2x - 1}$

14.  $(2x - 1)^{2/3} = x^{1/3}$

15.  $\sqrt{x} - (3)^4\sqrt{x} - 4 = 0$

16.  $x^{1/2} + 3x^{-1/2} = 10x^{-3/2}$

17. Factor  $x^6 - 2x^4 + x^2$  completely and find all of the real solutions of the equation  $x^6 - 2x^4 + x^2 = 0$ .

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## L6 Linear Inequalities and Algebraic Errors

Reading: Appendices A.6 and A.7

Exercises (A.6), page A64: 4, 7, 9, 15, 28, 38, 40, 53, 54, 58, 69, 76, 78, 81, 82, 83, 85, 87, 89, 91, 94, 95, 98, 102, 103, 109

Exercises (A.7), page A2: 15, 16, 22, 26, 31, 33, 43, 49, 55, 64, 67, 72

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## L7 Rectangular Coordinates and Graphs

Reading: Sections 1.1 and 1.2

Exercises (1.1), page 8: 1, 2, 3, 4, 14, 24, 32, 45, 51, 54, 56, 58

Note: The correct answer for 58(a) is  $(x_0, -y_0)$ .

Exercises (1.2), page 19: 3, 4, 5, 10, 26, 28, 29, 31, 34, 38, 43, 47, 48, 71, 74, 76, 79, 90

Additional exercises:

1. Find the equation of a circle in standard form with center at the point  $(-3, 2)$  and tangent to the line (touching the line)  $y = 4$ .
2. Given the circle  $x^2 + (y + 1)^2 - 1 = 8$ , find its center, radius, and intercepts. (Hint: Sketch the graph.)

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## L8 Linear Equations and Functions

Reading: Sections 1.3 and 1.4

Exercises (1.3), page 31: 1, 2, 3, 4, 5, 6, 9, 11, 14, 19, 23, 30, 39, 45, 51, 53, 55, 65, 67, 70, 74, 87, 89, 90, 91, 93, 94, 96, 99, 101, 102, 103, 104, 105, 112

Exercises (1.4), page 44: 1, 2, 4, 7, 11, 12, 24, 29, 32, 36, 40, 47, 48, 57, 58, 59, 61, 63, 64, 68, 71, 73, 78, 82, 85, 86, 88, 89, 90, 93

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## L9 Analyzing Graphs of Functions

Reading: Section 1.5

Exercises (1.5), page 56: 1, 2, 3, 4, 5, 6, 7, 9, 11, 13, 18, 20, 23, 33, 37, 55, 56, 62, 66, 71, 72, 73, 83, 85, 88a, 93, 94, 95, 96, 98

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## L10 A Library of Functions and Transformations of Functions

Reading: Sections 1.6 and 1.7

Exercises (1.6), page 65: 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 35, 36, 39, 43, 47, 48, 49, 50

Exercises (1.7), page 72: 1, 2, 3, 4, 5, 9, 11, 13, 14, 15, 16, 17, 19, 20, 21, 23, 25, 27, 29, 31, 33, 39, 47, 50, 51, 53, 55, 57, 71, 73, 74, 75, 76, 78, 80

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### L11 Combinations of Functions

Reading: Section 1.8

Exercises (1.8), page 81: 3, 9, 13, 17, 18, 23, 25, 31, 34, 35, 37, 42, 43, 45, 51, 55, 59, 60, 61

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### L12 Inverse Functions

Reading: Section 1.9

Exercises (1.9), page 90: 1, 2, 3, 4, 5, 6, 14, 19, 21, 27, 29, 33, 35, 37, 39, 45, 49, 50, 57, 61, 63, 64, 65, 70, 72, 73, 76, 79, 84, 86, 88, 92, 93, 95, 96, 97, 101

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### L13 Quadratic Functions

Reading: Section 2.1

Exercises (2.1), page 120: 3, 5, 6, 7, 9, 11, 15, 22, 32, 43, 44, 48, 50, 58, 68, 74, 75, 76, 77, 80, 83, 87, 88, 89, 90, 92

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### L14 Polynomial Functions of Higher Degree and Division of Polynomials

Reading: Sections 2.2 and 2.3

Exercises (2.2), page 133: 1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 15, 17, 19, 21, 23, 27, 29, 61, 63, 65, 69, 71, 76, 78, 80, 82, 85, 87, 97a, b, 100a, b, 105, 107, 108, 109, 110, 111, 112, 113, 115

Exercises (2.3), page 144: 2, 3, 4, 5, 6, 8, 12, 24, 34, 38, 48, 55, 60, 67, 68, 84, 87, 90, 92, 95, 97

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### L15 Complex Numbers

Reading: Section 2.4

Exercises (2.4), page 152: 1, 2, 3, 4, 5, 6, 7, 9, 13, 17, 19, 25, 27, 36, 38, 42, 45, 47, 49, 51, 56, 60, 64, 65, 67, 69, 72, 81, 85, 87, 93, 94, 96, 97, 99

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### L16 Zeros of Polynomial Functions

Reading: Sections 2.5 and 2.6

Exercises (2.5), page 164: 2, 3, 4, 5, 6, 9, 11, 13, 15, 17, 20, 26, 30, 33, 46, 48, 50, 52, 56, 62, 63, 78, 99, 104, 113, 115, 116, 117, 118, 119, 120, 121, 122, 123, 128, 130, 131

Exercises (2.6), page 177: 2, 3, 7



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### **L17 Rational Functions**

Reading: Section 2.6

Exercises (2.6), page 177: 10, 13, 15, 21, 28, 29, 31, 34, 35, 38, 41, 42, 43, 44, 67, 73  
a, b, 78, 80, 81, 82

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### **L18 Nonlinear Inequalities**

Reading: Section 2.7

Exercises (2.7), page 187: 1, 2, 3, 4, 7, 13, 15, 24, 28, 30, 35, 36, 37, 38, 46, 52, 53, 66,  
74, 76, 78, 90

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### **L19 Linear and Nonlinear Systems of Equations**

Reading: Sections 7.1 and 7.2

Exercises (7.1), page 473: 3, 4, 8, 10, 12, 14, 16, 20, 23, 26, 30, 32, 38, 42, 56, 59, 66,  
70, 71, 72

Exercises (7.2), page 484: 12, 16, 21, 22, 30, 31, 32, 33, 34, 42, 44, 49 a, c, 52, 62

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### **L20 Exponential Functions**

Reading: Section 3.1

Exercises (3.1): page 208: 5, 6, 13, 14, 15, 16, 17-22 all without a calculator, 23-26  
all, 39-44 all without a calculator, 52, 54, 57 use calculator, 63 use calc., 65 use calc.,  
72, 73, 74, 76, 78, 79, 84, 85

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### **L21 Logarithmic Functions**

Reading: Section 3.2

Exercises (3.2), page 218: 1-7 all, 9, 11, 13, 15, 17, 19, 25-28 all, 30, 32, 33, 37-40 all,  
43, 45, 46, 48, 49, 52, 53, 56, 61, 63, 66, 68, 74, 76, 82, 83, 84, 88

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### **L22 Properties of Logarithms**

Reading: Section 3.3

Exercises (3.3), page 225: 4, 5, 6, 7, 15, 16, 18, 19, 21-37 all, 39, 41, 42, 43, 45, 49, 52,  
54, 56, 57, 59, 60, 62, 64, 68, 73, 74, 75, 76, 78, 80, 84

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### **L23 Exponential and Logarithmic Equations**

Reading: Section 3.4

Exercises (3.4), page 235: 1, 3, 5, 7-17 all, 20, 22, 24, 26, 32, 36-62 even, 72-82 even, 87-90 all

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### **L24 Exponential and Logarithmic Models**

Reading: Section 3.5

Exercises (3.5), page 245: 1, 5, 8, 10, 14, 16, 21, 24, 26, 33, 34, 36, 44, 57

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### **L25 Radian and Degree Measure**

Reading: Section 4.1

Exercises (4.1), page 269: 1-7 all, 9, 12, 14, 16, 17-31 odd, 35, 38, 39, 42, 44, 52, 54, 55, 56, 57, 61, 62, 64, 66, 69-73 all

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### **L26 Trigonometric Functions and the Unit Circle**

Reading: Section 4.2

Exercises (4.2), page 277: 1-5 all, 8, 9-13 all, 18, 19, 20, 22, 23, 29, 32, 33, 35, 36, 38, 40, 49, 53, 54, 60, 61

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### **L27 Right Triangle Trigonometry and Trigonometric Functions of Any Angle**

Reading: Sections 4.3 and 4.4

Exercises (4.3), page 286: 1-5 all, 7, 11, 21, 23, 25, 27, 29, 43, 44, 50, 52, 54, 56, 57, 59, 61, 63, 64, 66, 67, 68, 69, 70, 71, 72, 77, 78-85 all, 88

Exercises (4.4), page 296: 1-9 all, 11, 19, 20, 21, 22, 24, 28, 30, 31, 34, 36, 37, 39, 41, 43, 46, 48, 49, 51, 55, 56, 63, 66, 68, 70, 74, 91, 96, 97, 103, 106

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### **L28 Graphs of Sine and Cosine Functions**

Reading: Section 4.5

Exercises (4.5), page 306: 1-5 all, 7, 18, 19, 21, 23, 25, 27, 29, 32, 35, 37, 43, 44, 48, 59, 61, 73, 76, 80, 83, 86, 88, 97, 102

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### **L29 Graphs of Other Trigonometric Functions**

Reading: Section 4.6

Exercises (4.6), page 317: 1, 2, 3, 5-14 all, 17, 21, 24, 28, 34, 37, 49, 62, 63, 85, 86, 87, 92

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### **L30 Inverse Trigonometric Functions**

Reading: Section 4.7

Exercises (4.7), page 326: 1, 2, 3, 4, 5-17 odd, 19 no calc, 20 no calc, 39, 40, 42, 46, 47-52 all, 54, 56, 58, 66, 70, 72, 74, 78, 80, 81, 83, 86, 97-102 all, 104a, 104b use calc, 108a, 108b use calc, 110-114 all

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### **L31 Applications**

Reading: Section 4.8

Exercises (4.8), page 336: 1, 5, 10, 16, 20, 22, 24, 26, 29, 33, 34, 36, 37, 40, 42, 46

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### **L32 Using Fundamental Identities**

Reading: Section 5.1

Exercises (5.1), page 355: 1-6 all, 8, 9, 10, 14, 15-20 all, 21-45 odd, 49, 53, 56, 57, 61, 63, 69, 71

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### **L33 Verifying Trigonometric Identities**

Reading: Section 5.2

Exercises (5.2), page 362: 1-8 all, 13, 16, 19, 27, 29, 33, 39, 41, 47, 59, 61, 64, 67, 68, 69, 71

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### **L34 Solving Trigonometric Equations**

Reading: Section 5.3

Exercises (5.3), page 371: 3, 4, 5, 9, 11, 13, 17, 19, 23, 27-45 odd, 63, 65, 73, 85, 87

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### **L35 Sum and Difference Formulas**

Reading: Section 5.4

Exercises (5.4), page 379: 1-7 all, 9, 11, 17, 27-41 odd, 45, 47, 53, 57, 63, 65, 69, 73, 81-84 all, 86

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### L36 Multiple-Angle and Product-to-Sum Formulas

Reading: Section 5.5

Exercises (5.5), page 389: 1-7 all, 9-27 odd, 33, 37, 41, 45, 65, 68, 69