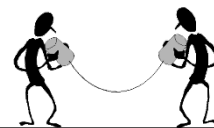# Welcome to MA 15400 College Algebra Online
Spring 2024 for 8 Weeks

Instructor: John LaMaster
Preferred Pronouns: He, him, his
Office: Kettler 264

How to Reach Me: E-mail: **lamaster@pfw.edu** ⟵ **preferred**
Please use the following protocol when e-mailing me ⟶
Google Voice: 260-267-0486
Office/voice mail: 260-481-5430
Math Dept: 260-481-6821
I normally respond within 24 hours (often sooner)
except on holidays and weekends.

- To make sure your email reaches me, include in the subject line your full name and course. For example: **Peter Parker**, **MA 154 Online**
- University policy requires that you use your university e-mail address to email me to protect your privacy. Please do not use your private email address.
- Please keep the topic about the class.
- For questions about assignment due dates check out eHW or the **Rhino Checklist** or Brightspace first.
- I prefer you call address me as just *John*.

Office Hours: Monday and Wednesday: 11:00-11:50 in KT 218
Also by appointment in person or Zoom **HERE**.

Prerequisites: MA 15300 with C- or higher or placement by departmental exam. This course is primarily intended for students who have completed at least two years of high school algebra.

Course Website: Go to **purdue.brightspace.com** to access our course. Click on **Purdue Fort Wayne**, enter your PFW username and password, and click **Log in**. The suggested browsers are Chrome and Firefox.
Explore and become familiar with the content and resources available in Brightspace.

Course Structure: Videos on Brightspace are best watched with pencil and paper in hand so you can work along with the class on the video. Assignments and tests are completed using **e-Homework** (commercially called Möbius).

TIP: Keep a special section in your notes or a binder to collect any questions as you watch the videos and work on e-Homework.

You will also connect with other students in the class through our online asynchronous discussion forum.

Materials: In addition to access to a device that plays audio and video using a good Internet connection (a computer or laptop is recommended instead of a phone), as well as a notebook plus binder for organizing your notes, please see these three items below.

1. Access to **e-Homework** (*eHW*) will be **required** for all your graded homework, quizzes, and tests. Follow the steps on the **_eHW_ Web Site** to purchase a license ($20) and to access it.

   Despite the extra fee for *eHW*, past students have shared that it was worth every penny. It gives you the essential practice you need to succeed.

   TIP: If you have purchased access to *eHW* less than a year ago for this course, you need not purchase it again. You just need to register for this section.
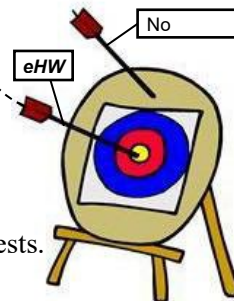
2. A **graphing calculator** will be used for activities, assignments, quizzes and tests. The **TI-84 Plus** or **TI-84 CE Plus** are the *tools of choice*.
   Note: You can rent one at Walb Student Union 225 (260-481-6586).
   Click **HERE** for more information.
   Since all quizzes and tests are online, these free alternatives are also possible: **Wabbit Emu**
   Desmos
   Yo! Optional!
   If you know of other free options, please share this info with me. **Geogebra**

3. The **text** *Functions Modeling Change, 6th Edition* by Connally, et al. is **optional** but recommended. Some students have shared they did fine without a text and learned everything from doing eHW.

   TIP: You can also use the 5th Edition or even the 3rd. We do **NOT** use WileyPLUS.
   You might find it for cheap online at **Chegg**, **Amazon**, **eBay**, **betterworldbooks.com**, and from **Wiley**.
   Recommended exercises out of the text will be given to deepen your understanding, but not required.

Objectives and Content: This course emphasizes mathematical modeling of real-world problems using linear, exponential, and trigonometric functions. Topics also include vectors, parametric equations, and conic sections.. Solutions to the problems are formulated, validated, and analyzed using mental, paper and pencil, algebraic, and technology-based techniques as appropriate. We will cover portions of Chapters 7-10 and Chapters 12-14. Course goals are listed on the ***General Course Information*** document. Learning outcomes are listed in the lessons provided on Brightspace in the *Supplementary Resources* folders for each section of the text. See the *Flash Cards* on Möbius for assessment questions aligned to each learning outcome.

Grading:

Prerequisite Skills Quiz……………...25 pts.   (4.31%)
Participation…………………….…10 pts   (1.73%)
e-HW Assignments………….....…… 100 pts.   (17.24%)
Test 1 ………………………………100 pts.   (17.24%)
Test 2 ………………………………100 pts.   (17.24%)
Test 3 ……………………………....100 pts.   (17.24%)
Comprehensive Final Exam ………. 145 pts.   (25%)
Total Points Possible ………….…**580 pts.**

Grading Scale:

90% -100% (552 pts. or more)	A
80% - 89% (464 to 551 pts.)	B
70% -79% (406 to 463 pts.)	C
60% - 69% (348 to 405 pts.)	D
<60% (Below 348 pts.)	F

Prerequisite Skills Quiz: This quiz provides quick and early feedback to you on your proficiency with the skills needed for this course. Study the eHW assignment *Math Background Needed for MA 15300* (and its worked out solutions). There are eHW Flash Cards to practice this content on the **eHW Web Site**.

Participation: Post your self-introduction on Brightspace and submit the *Getting to Know You* survey, each worth 5 points. Some ways to earn +1 Rhino bonus toward your participation score attach a photo to your self-introduction on Brightspace or post substantively to the **Piazza Discussion Board.** Please reach out to me for help if your life is disrupted for any reason. I am here to help.

e-HW Assignments: You have unlimited attempts until the due date and the highest score is taken. The average score of all your best eHW scores is converted to a percentage and taken out of 100 points. For example, a student with perfect scores on every eHW assignment earns 100 points; one who scores an average of 80% earns 80 points, etc. Please read the section on eHW in the ***General Course Information***.

Past students cite eHW as the key to their success.
You are encouraged to the assignment **multiple times** (even after you have earned a perfect score).
Research shows that students who do this retain the material better for the test.

> **TIP:** You have **unlimited attempts** until the due date and the highest score is taken.
> The average score of all your best eHW scores is converted to a percentage and taken out of 100 points.

- **Late eHW** may be submitted for some partial credit, but certain conditions apply: for each perfect score you earn before the due date in the *Assignments (for a Grade)* area, you may redo one past due assignment at a 10% late penalty, i.e. for late eHW, a score of 20 would be entered in the Brightspace grade book as a score of 18. Go to the tab in Möbius called *Rhino Opportunity for Late Assignments* to access these after the due date.

- **eHW Guarantee:** The question bank is well scrubbed; however, if you do find that your answer is correct and the system tells you otherwise (due to mathematics, not text entry) and you are the first to report it to me, **lamaster@pfw.edu**, I will gratefully award you double points for that question.

Tests and the Final Exam: All tests and the final exam are online through Möbius.
Keep track of these dates in your personal calendar:

Test 1 *(Tentatively Sections 7.1-7.3 and Special Angles):* Tues., March 19 − Sun., Mar. 24
Test 2 *(Tentatively Sections 7.4-7.8, 8.1-8.2, 9.1):* Tues., April 2 − Sun., April 7
Test 3 *(Tentatively Sections 9.2-9.4, 10.1-10.2, 12.1-12.3, 13.1-13.2):* Tues., April 16 − Sun., April 21
Final Exam *(Tentatively Sections 13.3-13.4, 14.1-14.4 and all prior content):* Mon., April 29 − Sat., May 4
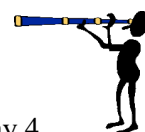
Student Support: I want you to be successful. Please reach out if you need help. Below is a directory of resources for specific issues. If technical difficulties affect your ability to complete assignments, please notify me as soon as possible.

For help with:	Contact:	Contact Information:
General Needs	Academic Services, Technology Services, Health and Wellness, and Support from Administrative Offices	See the Student Support Services **Website**
PFW account/password/ Brightspace Support	Information & Technology Services (ITS) Help Desk	Call: 260-481-6030 Email: **helpdesk@pfw.edu** See the **ITS Website**
eHW (Möbius) Purchasing an *eHW* access code	Digital Ed Customer Support	1-833-450-2211 Email: **support@digitaled.com**
Troubleshooting *eHW*	*eHW* Technical Support	Email: **ehwtechsupport@pfw.edu**
Graphing Calculator Rental	Student Government	Walb 225 or call: 260-481-6586 See the **Graphing Calculator Rental Website**
Using eHW	Check out the resource **General Course Information for MA 15300 and MA 15400** first. Then see the **Möbius Support Website** for help.	
Tutoring	Online **HERE** and Face to Face tutoring in KT G19 for those able to come to PFW.	
Short-term Counseling (Free)	Campus Health Clinic	Call the 24 hour Hotline: 800-342-5653 See their **Website**.
Withdrawing from the class	Student Success & Transitions	Call: 260-481-0404, E-mail: **withdraw@pfw.edu** See the Student Success & Transitions **Website**.
How to succeed in MA 15400	Students enrolled in a previous MA 15400 semester	See **the tips they wrote** specifically to you!
If you don't know where else to turn for resources, then contact…	… the CARE team	See their **Website** or call: 260-481-6601
Accommodations for students with disabilities*	Disability Access Center (DAC)	Walb 113, 260-481-6658, See their **Website**.

*For Students with Disabilities
If you have a disability and need assistance, special arrangements can be made to accommodate most needs. Contact the Director of the Disability Access Center (Walb Union, Room 113, telephone number 481-6658) as soon as possible to work out the details. Once the Director has provided you with a letter attesting to your needs for modification, bring the letter to me. For more information, please visit the **Web site for Disability Access Center** (DAC) and refer to the **DAC Student Handbook**.

Rhino Success
I believe in your success and want to support you to meet your goals.
You can do it!
But it will require that you take charge of your learning, do the work required, and make the commitment to do what it takes to succeed.
If you want to succeed in life, be like the rhinoceros!
Wake up each morning and CHARGE straight ahead to accomplish your goals.
No obstacles get in the way of a 3 ton snorting rhinoceros charging at full speed!

Overall Course Schedule: The tentative course calendar on the next page provides more details about deadlines and may be helpful to see the big picture. The deadlines are also on the eHW (Möbius) Website and on the Brightspace Calendar and on this handy, clickable **Rhino Checklist**.

We Are in this together: If for any reason you are unable to complete a test during the specified dates for reasons beyond your control, please reach out to me for help. I am here for you and want you to succeed.

Overall Course Schedule

Schedule and assignments subject to change. Any changes will be posted in Brightspace

Topic	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Sat
Week 1 (Mar. 11-16): Sections 7.1-7.4 Periodic Functions and the Sine Function (with its Sidekick, Cosine)	Mar 10	Mar 11	Mar 12	Mar 13 Self-Introduction on Brightspace due Getting to Know You Survey due eHW0: General Course Info due eHW Syllabus Scavenger Hunt & Course Tour	Mar 14	Mar 15 eHW on Math Background due eHW 01 Sections 7.1-7.2 Prerequisite Skills Quiz closes	Mar 16
Week 2 (Mar. 18-22): Sections 7.4-7.5 Graphs of Sine and Cosine Functions	Mar 17	Mar 18 eHW 02 Section 7.3-7.4 eHW 03 Special Angles	Mar 19 T1 opens	Mar 20	Mar 21	Mar 22	Mar 23
Week 3 (Mar. 25-31): 7.6-7.8, 8.1, 8.2, 9.1 The Fractional Trig Functions and Solving Triangles	Mar 24 T1 closes	Mar 25 eHW 04 Section 7.5	Mar 26	Mar 27	Mar 28	Mar 29	Mar 30
Week 4 (April 1-5): Sections 9.2-9.4, 10.1-10.2, Analytical Trigonometry & Function Composition/Decomposition, Inverses	Mar 31	Apr 1 eHW 05 Section 7.6-7.8 eHW 06 Section 8.1-8.2, 9.1	Apr 2 T2 opens	Apr 3	Apr 4	Apr 5	Apr 6
Week 5 (April 10-14): Sections 12.1-12.3 ? 13.1-13.2 Vectors and Sequences	Apr 7 T2 closes	Apr 8 HW 07 Section 9.2-9.3 eHW 08 Section 9.4, 10.1-10.2	Apr 9	Apr 10	Apr 11	Apr 12	Apr 13
Week 6 (April 17-21): Section 13.3-13.4, 14.1-14.3 Series, Parametric Equations, and Conic Sections	Apr 14	Apr 15 eHW 09 Section 12.1-12.3 eHW 10 Section 13.1-13.2	Apr 16 T3 opens	Apr 17	Apr 18	Apr 19	Apr 20
Week 7 (April 22-26): Section 14.4,9.5 Hyperbolas and Complex Numbers	Apr 21 T3 closes	Apr 22 eHW 11 Section 13.3 and 13.4 eHW 12 Section 14.1-14.3	Apr 23	Apr 24	Apr 25	Apr 26 eHW 13 Section 14.4 and 9.5	Apr 27
Week 8 (April 29-May 4): Final Exam Week	Apr 28 All late eHW closes	Apr 29 Final Exam opens	Apr 30	May 1	May 2	May 3	May 4 Final Exam closes

All eHW assignments, tests, and the final exam are completed online through Möbius **HERE**.
They close at 11:59 PM on the day indicated.

- You have unlimited attempts to complete your eHW Assignments until the deadline.

- **To help accommodate any possible Internet outages, you will have 3 attempts for each test.**
  You have 180 minutes to complete each test, taking the highest score. The longer time limit is so you can take it unrushed. Please contact me as soon as possible if you have any issues that prevent you from completing your work. I encourage you to reach out to me.

Rhino Awards and Badges:

- **Rhino Hot e-Homework Assignment Award:**
  For each eHW Assignment earned at 90% or above, you can redo one eHW at 10% late penalty.
- **Rhino Syllabus Award:**
  Earn a +1 Rhino Bonus on the eHW *Syllabus Scavenger Hunt* if it is a score of 100%.
- **Rhino Key Contributor Award:**
  Earn a +1 Rhino Bonus to *Participation* if you post at least once to the **Piazza Discussion Board** in a way that supports others' learning.

TIP: Use the handy, click-able **Rhino Checklist** to also keep track of earning these Rhino Awards, as well as other graded assignments in the course. You can also see awards in **Course Tools > Awards.**

You have reached the end of this syllabus, and I am grateful that you took the time to read it. Thank you! In gratitude, click on the image of the cheering rhinoceros on this page for something cool. I look forward to having an awesome semester together.

1. The Course Goals

Many students take this course because it is required for their degree. But there are better reasons than that!
In *College Algebra* (MA 15300), *Trigonometry* (MA 15400), and *Precalculus* (MA 15900) you will:
- Highlight the link of mathematics to the real world.
- Develop a wide base of mathematical knowledge, including
  - basic skills and concepts,
  - a functional view of mathematics, including graphical, algebraic, numerical, and contextual viewpoints,
  - properties and applications of some of the basic families of functions
  - geometric visualization,
  - problem solving, predicting, critical thinking, and generalizing.
- Incorporate the use of general academic skills such as
  - communicating mathematics concepts,
  - understanding and using technology, and
  - working collaboratively.

*The above aligns with the foundational intellectual skills for quantitative reasoning in the **Indiana College Core** and is based on the guidelines of the Mathematical Association of America's subcommittee, **Curriculum Renewal Across the First Two Years** (CRAFTY).*

2. General Education Course Learning Outcomes

College Algebra and Trigonometry addresses all eight outcomes in Area 3: Quantitative Reasoning of the Indiana College Core (listed below). Through hands-on activities and assessments you will
- create and interpret mathematical models to solve problems presented as real world situations,
- formulate, validate, and analyze solutions to problems using mental, paper and pencil, algebraic, and technology-based techniques as appropriate
- utilize graphing calculators to find the solution to problems which cannot be solved by pencil and paper, as well as explore mathematical patterns and visualize mathematical ideas,
- recognize and cite assumptions made in real world problem solving, and
- communicate your reasoning.

Indiana College Core Area 3 Quantitative Reasoning Competencies

Interpretation and Representation
3.1. Interpret information that has been presented in *mathematical form**.
3.2. Represent information/data in *mathematical form** as appropriate
   **mathematical form* = functions, equations, graphs, diagrams, tables, words, and geometric figures.
Mathematical Procedures
3.3. Demonstrate skill in carrying out mathematical (e.g. algebraic, geometric, logical, statistical) procedures flexibly, accurately, and efficiently to solve problems.
Critical Thinking
3.4. Analyze mathematical arguments, determining whether stated conclusions can be inferred.
Application / Analysis
3.5. Communicate which assumptions have been made in the solution process.
3.6. Analyze mathematical results in order to determine the reasonableness of the solution.
3.7. Cite the limitations of the process where applicable.
Communication
3.8. Clearly explain the representation, solution, and interpretation of the math problem.

Click **HERE** for more information about the Indiana College Core.

3. **Study Time Outside of Class**

This course requires a solid effort. During the Fall or Spring Semester, the faculty at PFW expect you to study a minimum of 6 hours a week outside of class working on mathematics for MA 15300 or MA 15400 and 10 ten hours per week for MA 15900. This pace is accelerated in the summer sessions.

4. **Accessibility and Accommodations**

If you have a disability and need assistance, special arrangements can be made to accommodate most needs. Contact the Director of Services for Students with Disabilities (SSD). They are located at Walb Student Union, Room 113, telephone (260)481-6658, as soon as possible to work out the details. Once the Director has provided you with a letter attesting to your needs for modification, bring the letter to your instructor. For more information, please visit the Web Site for SSD: **pfw.edu/ssd/** .

5. **Prerequisite Skills**

MA 15300, MA 15400, and MA 15900 are intended for students who have completed two years of high school algebra. The prerequisite for MA 15300 or MA 15900 is completion of Intermediate Algebra MA 11100 with a B- or higher or placement by departmental exam. The prerequisite for MA 15400 is MA 15300 with a C- or higher or placement by departmental exam. Look at the kinds of problems in the Math Background assignment on eHW. If they do not look familiar, perhaps you need to drop the class and take either the prerequisite Intermediate Algebra MA 11100. For those needing MA 15300, PFW does not offer a course lower than MA 11100.

6. **Graphing Calculators**

Graphing calculators are used for activities and assignments in and out of class. The TI-84 Plus or TI-84 Plus CE is strongly recommended. You may use another equivalent calculator* but you will be responsible for understanding how to use it. Your instructor will be most familiar with the TI-84 Plus or TI-84 Plus CE and may not be able to offer you help with other calculators.

*Your calculator should have features which enable you to find **intersection points**, **zeros (or roots), maximum/minimum points** of graphs, and explore functions numerically with **tables**. If you have questions whether your model of calculator is allowed, ask your instructor.

Graphing Calculator Loan Program: You can rent a TI-84 Plus for the semester for a nominal fee from the Purdue University Fort Wayne Students' Government Association, located in the Walb Student Union Room 225, Telephone 260-481-6586. Supplies are limited and are usually depleted the first week of classes. However, some students may have dropped a class which requires a calculator so one could just be sitting here on a shelf waiting just for you. More information is **HERE**.

7. **Computer and Internet Access**

Student-access computer labs are located around campus. For a complete list, go to the Information Technology Services Website **HERE**. To use the computers in these labs you must have an activated PFW computer Lab Account, which you received when you enrolled in PFW. For assistance contact the Help Desk at Kettler 206 or email **helpdesk@pfw.edu**. The Help Desk hours are listed on their Website **HERE**.

Borrowing a Laptop or Desktop System: Information Technology Services (Call: 260-481-6030, Email: helpdesk@pfw.edu) has a limited number of laptops and desktop systems that may be loaned to students, faculty, and staff who have internet access available at home. The desktop systems do not have wireless capability, so they must be connected directly to your wireless router via a standard Ethernet cable. Additionally, Helmke Library (Call: 260-481-6505, e-mail: ref@pfw.edu) has a limited number of laptops that may be checked out by students.

8. **Office Hours and Free Tutoring**

- Instructors' **Office Hours** are open to students in any section. See Brightspace for the current semester schedule.
- **Face-to-Face tutoring** is available in Kettler Hall G19. Hours are posted on Brightspace.
- The **Piazza Discussion Boards** for MA 15300 and MA 15400 are at **https://piazza.com/pfw** and includes students from all sections of the course. You can post anonymously to the class if you wish. Students often answer other students' questions.

9. **e-Homework (eHW)**
Great news! The Web-based electronic homework system (also called Möbius) will immediately grade your answers and will provide worked-out solutions. It is only $15 for an entire year's worth of access. You will use it for all of your graded work.

Need Help?
Once you are logged in, click on the word **Help** near your name on the top of the screen to access online help. You can also check out the **Möbius Support Site** for help, where you can type a topic in the search box or peruse the popular choices on the page. In addition, you can e-mail **ehwtechsupport@pfw.edu** for troubleshooting. It will be helpful if you can describe the problem in as much detail as possible or provide screenshots.

Getting to the eHW Site
To access eHW, click **HERE**.
Already Have an Account?
If you have already had previous access to Möbius, enter your email and password to login.
If you forgot your password, click on the words **Forgot your password**. You will be prompted for the email for your account, to which a system generated password will be sent. Once you login again you can change it by clicking on your name in the top right corner and then click on **Password Update**.)

Need an Account or License or Enroll in a Class?
If you have not already had previous access to Möbius, click on "Create an account."
For detailed step-by-step instructions on how to create an account, enroll in a class, and purchase a license, see your

Your Work Is Automatically Saved
All of your work is saved up until the last question you were working on, so in case the Internet connection goes down, you have not lost your previous work. You do not have to complete an assignment in one sitting.

How to Submit an Assignment
Be aware that these two buttons behave differently: | Submit Assignment | Quit & Save |
After you complete an electronic homework assignment, the only way for your instructor to receive your grade is if you click on the first button, **Submit Assignment**. Your work will be instantaneously graded and you will see your score.
You would click on the second button, **Quit & Save**, to return to the assignment to work on it later.
If you can see it in your Gradebook link, your instructor can see it as well.

If a time limit is set for a quiz or test, then it counts down from when you started the assignment. If you close your browser (or use the Quit & Save button) before clicking on Submit Assignment, the timer will continue to count down.

How to See Worked Out Solutions
Once you have submitted your assignment and it is graded, click on | View Details |
to view your graded assignment and see any detailed feedback that is available, with an option to print.
To make the most out of eHW,
- Try the assignments as many times as you can. You have unlimited attempts before the deadline.
  Subsequent attempts show variations of the problem with the same learning objective.
- Use "Just for Practice" sets to see worked out solutions of problems that are similar to those on your assignment.
  You can click on "How Did I Do?" at each question.
  The "Just for Practice" sets provide you a powerful study technique called *retrieval practice* where you train your brain to bring the correct information to mind that is needed for the task at hand. It moves information from short term memory into long term memory.
- Use the "Flash Cards" to hone in on particular learning outcomes. Many students credit their use of flash cards prior to quizzes and exams as the reason for their high performance.

Questions with Multiple Parts Presented One at a Time

Some questions may be delivered to you one part at a time, such as the one shown below. After you enter your answer, click on **Verify** to move to the next part.

In some questions, the correct answer to the first part of the question may display before you enter the answer to the next part.

> Below is an example of a multi-part question with this feature.
>
> **(a)** What are Purdue Fort Wayne's school colors?
>
> ○ watermelon and peach ○ chartreuse and periwinkle ○ lemon zest and lime green ○ **black and gold**
>
> To move to the next part after you enter a response, press **Verify**.
>
> Section   Attempt 1 of 1
>
> [Verify]

After clicking **Verify,** part **(b)** of the question will display.

> **(a)** What are Purdue Fort Wayne's school colors?
>
> ○ watermelon and peach ○ chartreuse and periwinkle ○ lemon zest and lime green ◉ **black and gold**   ✓
>
> Correct response:
>
> **black and gold**
>
> To move to the next part after you enter a response, press **Verify**.
>
> **(b)** In which city is Purdue Fort Wayne located? Hint: It's name reveals the answer.
>
> [Click for List   ▼]
>
> Section   Attempt 1 of 1
>
> [Verify]

Be sure to complete all parts of the questions.

How to See Your Grades and Past Results

Throughout the semester, you may wish to look at the questions and solutions of past eHW assignments that you completed. The highest score on your assignment appears on the eHW homepage, but you can see all graded attempts by clicking on the link **Gradebook > View Past Results**.

> möbius   Gradebook ▾   External ▾
>
> 🏠
>
> View Past Results
>
> Grade Reports

For more on using the Gradebook, see the online help by clicking **HERE**.

Working with Math in Responses

You enter formulas using standard mathematical notation similar to that used in a graphing calculator, following the rules for standard order of operations. Some helpful tips follow for entering responses.

Avoiding Common Math Errors

1. **Exponents:** Use the caret, ^, for exponentiation, and the letter e for 2.718...
2. **Parentheses:** As on a graphing calculator, you must use parentheses.
   When in doubt, you can use the **Preview** option to see it look the way it would in a math text.
   Examples:
   For $2^{x/13}$, you must type `2^(x/13)`

   not `2^x/13` . . . which would be interpreted as $\dfrac{2^x}{13}$

   For $y = \dfrac{x}{4(x-2)}$, you must type `y = x/(4(x-2))`

   not `y = x/4(x-2)` . . . which would be interpreted as $\frac{x}{4}(x-2)$

3. **Multiplication:** You can type an asterisk (i.e. *) for multiplication, or just type a letter and a number together (i.e. `2x`).

4. ***Square Roots:*** The square root function is `sqrt(x)` or you can just type `x^(1/2)` or `x^0.5` instead. Note again that, like on a graphing calculator, `x^1/2` means $\frac{x^1}{2}$.

5. ***Absolute Value:*** The absolute value function is `abs(x)`, so something like $2|x+1|-3$ would be typed as `2abs(x+1)-3`.

6. ***Argument of Functions:*** You should always place the input of a function in parentheses. For example, for $\sqrt{3x}$ you must type `sqrt(3x)`, not `sqrt 3x` which would be interpreted as $\sqrt{3}\cdot x$

For MA 15400 or MA 15900 students especially:

7. ***π:*** Simply type `Pi` or `pi`. (However, not `PI`.)

8. ***Trigonometric Functions:*** The names for common mathematical functions (sin, cos, etc.) are just what you would expect. The inverse trig functions are arcsin(x), arccos(x), and arctan(x). Also, trigonometric functions are all set to work in radians.

Using the Preview Option in Responses

Use the **Preview** option to view your response as a typeset mathematics expression. **Preview** demonstrates how the system interprets your entry (inspecting it for misplaced parentheses and other unintended keystrokes).

For example, suppose you were to type `sqrt(179)+3/pi` in the box. (Note that this is incorrect.)

Enter the following in the response box.
Type `pi` for π. Use the forward slash key (/) for division.

$$\frac{\sqrt{179}+3}{\pi}$$

TIP: Click on the Preview icon after the box (which looks like 🔍) to check your formula:

`sqrt(179)+3/pi`

Preview ✕
$\sqrt{179}+\frac{3}{\pi}$ 👎
Close

After clicking Preview, you can correct your response before submitting it for a grade.

`(sqrt(179)+3)/pi`

Preview ✕
$\frac{\sqrt{179}+3}{\pi}$ 👍
Close

Nested Parentheses

To computers and graphing calculators,
brackets such as [or]
or braces such as { or }
are not equivalent to parentheses.
For example, to enter $3^{2/(x+1)}$ you would type `3^(2/(x+1))` 👍

as opposed to `3^(2/[x+1])`. 👎

TIP: Using spaces may help readability.
For example, the expression `3^(2/(x+1))` could be typed `3^( 2/(x+1) )` to be read more clearly.
This is where using the **Preview** option, shown above, can be very helpful.

Order of Operations

Order of precedence is as follows:
  Parentheses
  Exponents
    Multiplication and **D**ivision (from left to right)
    Addition and **S**ubtraction (from left to right)

TIP: Some students use the mnemonic:
  Please
  Excuse
   My **D**ear
   Aunt **S**ally

For example, if you were to compute $8 \div 4 \times 2 + 3$, multiplication and division outrank addition, but multiplication and division are the same rank.

$$8 \div 4 \times 2 + 3 = \frac{8}{4} \times 2 + 3 = 4 + 3 = 7$$ 👍

Notice this is what you would obtain from a graphing calculator:

```
8/4*2+3
              7
```

Rules for order of operations are necessary so that a unique value results. Consider the following:

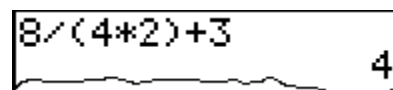$$8 \div 4 \times 2 + 3 \neq \frac{8}{4 \times 2} + 3 = 1 + 3 = 4$$ 👎

$$8 \div 4 \times 2 + 3 \neq \frac{8}{4 \times 2 + 3} = \frac{8}{11}$$ 👎

$$8 \div 4 \times 2 + 3 \neq \frac{8}{4} \times (2 + 3) = 2 \times 5 = 10$$ 👎

Parentheses outrank all operations. If your intention is to have $\frac{8}{4 \times 2} + 3$, the fraction bar serves as a grouping symbol.

The expression $\frac{8}{4 \times 2} + 3$ is equivalent to $\frac{8}{(4 \times 2)} + 3$.

So if our intention is $\frac{8}{4 \times 2} + 3$, we need parentheses: $8 \div (4 \times 2) + 3$. 👍
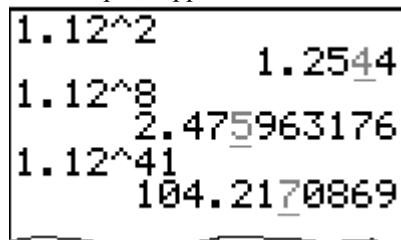
```
8/(4*2)+3
              4
```

Rules for Rounding

Look to the right of the rounding digit, which we have underlined.

Standard rules for rounding numbers apply.

For example, suppose we are rounding the following calculations to two decimal places.

```
1.12^2
              1.2544
1.12^8
       2.475963176
1.12^41
       104.2170869
```
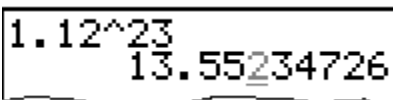
If it is 4 or lower, we truncate. So to two decimal places, $1.12^2 \approx 1.25$

If it is 5 or higher, we round up. So to two decimal places, $1.12^8 \approx 2.48$

and to two decimal places, $1.12^{41} \approx 104.22$

What is 1.12^{23} to two decimal places? Since the digit to the right of the rounding digit is 2, we have $1.12^{23} \approx 13.55$.

```
1.12^23
       13.55234726
```

Your calculator mode can be helpful to report answers to a selected number of digits.

```
NORMAL  SCI  ENG
FLOAT  0123456789
RADIAN  DEGREE
FUNC  PAR  POL  SEQ
CONNECTED  DOT
SEQUENTIAL  SIMUL
REAL  a+bi  re^θi
FULL  HORIZ  G-T
        ↓NEXT↓
```

```
1.12^2
              1.25
1.12^8
              2.48
1.12^41
            104.22
1.12^23
             13.55
```

However, use **caution** when doing so! It is easy to forget to change it back to FLOAT and report incorrect results when you need more precision.

10. Help!

So you're working your hardest, doing the assignments, studying every night, but it's just not enough?

Suggestion 1: If you have purchased the book, read it carefully. Again and again.

Suggestion 2: Do lots of individual homework. Understanding material in later chapters typically requires that you understand concepts in previous ones.

Suggestion 3: Recopy your notes.

Suggestion 4: Problem solving requires persistence. If you don't understand something the first time, you're in good company. Even Einstein had trouble and said, "Do not worry about your difficulties in Mathematics. I can assure you mine are still greater." Don't just give up. Take a break and come back and try again!

Suggestion 5: Remember, there's no substitute for daily preparation. Get help as soon as any problems arise. Which takes you to the next list of resources….

Resource 1. Talk to your instructor. Use the office hours.

Resource 2. Use the features of eHW, including viewing the details of worked out solutions, the *Just for Practice* homework sets, and eHW *Flash Cards*.

Resource 3. Use the supplemental resources in Brightspace.

Resource 4. If you can, connect with other class members outside of class and do your homework together.

Resource 5: Use the free tutoring and Piazza Discussion Board.