

2023 – 24 ATYP Precalculus Syllabus

Tuesday/Thursday: 1:20 – 3:50 pm

Instructor

Mrs. Ashley Koch (“Koch” is pronounced like “coach”)

Office hours: by appointment only. Email me to set up a time; a webex link will be sent to you.

E-mail: ashley.koch@wmich.edu

Phone:

Website

Gowmu.wmich.edu

- Used to access both **eLearning** for our course and **WMU email**.
- You should only use your WMU email to communicate with me when emailing. You should check your WMU email frequently!
- You will need to be able to access eLearning for certain things throughout the year (including the final exam), so be sure you can log in!

Supplies for Class

- **Textbook** (*provided*): Geometry, Prentice Hall Mathematics-High School Math Series, Laurie Bass, Randall Charles, Basia Hall, Art Johnson & Dan Kennedy, 2007
- **Calculator:** The TI-84 or TI-83 graphing calculator will be used as the primary computing device for this course. Students should become adept at using their graphing calculators not only to evaluate algebraic expressions, but also to investigate the behavior of functions and their graphs and to carry out elementary statistical procedures. Nevertheless, students also have to learn the basic paper-and-pencil rules and techniques of algebra and geometry. It is expected that students will be equally competent using both methods.
- **Notebook:** for in class notes and exercises.
- **Loose Leaf Paper:** if time permits to begin homework assignment in class.
- **Graph Paper:** 4 squares per inch, for accurate graphs. **All homework graphs need to be completed on graph paper.**
- **Folder or Binder:** to stay organized and hold all relevant course materials.
- **Pencil(s) and eraser:** Math should be completed in pencil, **not pen or marker**. Mistakes happen and should be easily correctable.
- **Ruler:** to be used for drawing straight lines and geometric constructions.
- **Highlighter:** can be useful in identifying important information or drawing attention to specific parts of notes/homework.
- **Colored Pencils:** (optional) same as for highlighter, but can also be useful when graphing multiple graphs on the same coordinate plane or constructing multiple shapes on the same paper.
- **Stapler** (optional) to secure homework assignments for submission.
- **Three Hole Punch** (optional) to ensure pages are not lost for binder storage.

Highlighted items in the list above will be available in class for student use and can be made available for students to borrow during the week.

Grading Scale

A (90 – 99%)

AB (80 – 89%)

B (70 – 79%)

C (60 – 69%)

NC (<60%)

To obtain credit for the course, students are expected to perform satisfactorily on both homework and exams. Both averages must meet the minimum requirements. Other factors, such as class performance and class discussion will assist the instructor in assessing the student's understanding of content. Final evaluations will assess the student's overall comprehension of the content. *Homework grades falling below 60% three times indicates that the program might not be suited to the student.* A conference between the parent(s)/guardian(s) and the teacher will be arranged.

Homework (and Other Academic Expectations)

- Mastery comes from practice, i.e., doing homework problems – on a daily basis. Concepts and skills are honed through study and completing homework assignments on time. Before attempting HW problems from the new section, read the section for understanding and review your notes from class. **Expect to spend an hour to two per day on your homework.**
- **Organization: (See below on page 5 for pictorial example)**
 - **It is imperative that your homework is easy to follow and neatly organized. If the problems are disorganized or hard to find, your homework will be returned to you without grading.**
 - Begin each homework by writing your name in the upper **right** hand corner margin. On each subsequent page, be sure to include your name with the page number in the top right hand margin.
 - In the upper **left** corner margin you may write the homework number followed by sections covered below the assignment number. - i.e. "Homework 1" or "HW 1."
 - Before answering any questions from a section, be sure to **label the section** itself. For Example, "Section 3.4" and beginning to complete problems on the lines below.
 - Start each problem by writing the problem number on the **left** of the margin. Clearly label each section and each problem number. Do not try to fill a page with problems written all over. Show steps/methods on separate lines. *If an answer comes from your calculator, state clearly the procedure you used and/or draw a sketch of your graphing screen.*
 - You may copy part of the problem, if desired, for shorter problems. You do not need to copy the entire question, especially for story-like problems.
 - Be sure to show all steps in completing problems, and **box in or circle your answer**. Write legibly. If your work cannot be read, it cannot be graded nor can feedback be provided.
 - Leave at least 2-3 lines between problems. This helps to quickly see where one problem stops and the next begins. Leaving space also provides room for feedback. Don't try to cram everything together – that is when homework becomes hard to follow.
 - Homework can also be completed entirely on graph paper, but be sure to follow the organizational expectations as noted above!
 - **Show all of your work** and give detailed, complete answers on all of your assignments and exams to earn full credit. Answers with little or no work to support them usually receive at best half credit, sometimes less. Showing your work allows us to give partial credit if your answer is incorrect, informs about misconceptions you may have, and is an important skill for upcoming coursework that utilizes math skills, logic, and analytical reasoning. In your career, you will almost always be expected to justify your work. Start now where we can help with feedback.
 - Complete problems sequentially by section. Problems out of order may not receive credit.
 - **Graphs are to be drawn on graph paper only** (4 squares per inch recommended). Any required graphs not completed on graph paper will not be graded. **Use a ruler for straight lines**. When using graph paper, clearly label which problem the graph accompanies. Graph paper used to draw accompanying graphs for problems should be stapled at the end of the homework.
 - The completed homework must be stapled on the top **left-hand corner**. One staple is sufficient. You need not staple it like a book binding.

- Please remove any perforated edges carefully before submitting. Your submitted homework should be neat and tidy. You can always ask if your homework meets the requirements before submitting!
- **Due Dates:** Homework will be turned in each week of class. Specific, individual due dates for assignments are outlined on the final page of this syllabus and provided on a separate sheet by itself as well. Please be reminded that being absent for ATYP is the equivalent of missing an entire week of your home school. Experience has shown that skipping a week proves to have a negative effect on student overall class performance and final grade.
 - If you must be absent and cannot submit your homework in person, you may have another student deliver your homework to class the day it is due.
 - If that is not a possibility, you will need to send a copy of the homework by email. Please do not send individual photos of each page. You may scan your homework and submit it as one file. If you do not have access to a scanner, you can use your phone to “scan” the document. Under the notes app, you can choose “scan document.” Hold the phone over each page and when it gives you an image for what it has scanned be sure the image is **clear** and that you **move any edges to match the actual paper**. When you have scanned all the pages, you can choose “done” and then “save.” Rename the document to the homework number and your last name. You can directly email it from your notes app as a PDF to my email, provided you have the outlook app.
- **Grading:** Homework will be graded each week. This may be a sampling of the problems or all of them. The solutions will be returned in a timely fashion to allow the student feedback on the problems. To assist in feedback to the student, the assignments have an overlap of sections from one week to the next.
- **Late homework** is any homework that is not turned in during the class it is due. Late homework will be accepted the following week after it is due **ONLY**. One should not make a habit of completing homework late. A conference between the parent(s)/guardian(s) and the teacher will be arranged for students who are turning in homework late more than once. Emailed copies of the homework are considered late homework, even if they may have been completed before class.
- **Corrections:** Students are encouraged to take risks, to make mistakes and to learn from them. To become fluent and competent in mathematics, students must be aware of their shortcomings and their wrong interpretations of concepts. Doing corrections is a very important habit in the growth of a student. You may turn in corrections and earn back points missed. Corrections must be done on an entirely different sheet of paper and the original homework included. Each corrected problem should be identified by the section number and problem number. Corrections may be submitted the week after the homework is returned to the student, completed, and returned the following week. Corrections are never required, but encouraged.
- **Other Important Considerations:**
 - One of the most important aspects of this class is the need for clear, logical and concise communication of mathematical concepts. A correct answer to a problem is not the end by itself – I seek for the flow of reasoning in arriving at the answer. **Students should be asking: What properties allow me to do that? What operations do I use? Is the answer reasonable?**
 - Every problem assigned should be completed. Do not give up on a difficult problem. Seek help, when needed as mentioned in sections above.

In-Class Expectations

This year, our class will be undergoing a number of changes to the “typical” classroom learning environment. We will be adopting a “Building Thinking Classroom” approach. [Please read the BTC welcome letter document linked here.](#)

Exams

Each Exam grade is weighted equally with the average of the previous six homework grades. Exam 1 and Exam 2 are written by the instructor. The Final Exam is the Michigan Standardized Exam covering all Geometry content. Exam 1 will focus content on chapters 1 – 4. Exam 2 will focus content on chapters 5 – 8. Since the final exam is cumulative and covers all content, Exam 2 may have content from the first four chapters as well. There is not a formal exam covering chapters 9 – 12 aside from the final exam.

Exams will be graded on whether or not the student demonstrated understanding of each standard, partial credit will not be awarded for exams. Rather, we will be using a rubric that contains information based on each individual student's performance regarding basic understanding, intermediate understanding, or advanced understanding. Data analysis will be performed for each student. Depending on the number of standards addressed, the students will receive two points for demonstrating basic understanding, three points for demonstrating intermediate understanding, and four points for demonstrating advanced understanding. Other data, such as observational data or conversational data collected during class will assist the instructor in assessing the student's understanding of content.

Tips for Success

- Begin homework as soon as possible after our weekly class sessions. Don't wait until the night before class to begin your homework!
- Take quality in-class notes, including documenting examples to reference later.
- Do some planning before you carefully document proofs and diagrams.
- Read the introduction to new sections for understanding.
- Pace yourself throughout the week with homework sessions each day or every other day.
- Work through the examples step-by-step, thinking about why each step was made.
- Work an odd numbered problem adjacent to the even numbered problem [answers in the back of the book].
- Write out every step in the solution process and check your work as you go.
- Attend help sessions, phone or email a classmate, or Mrs. Koch for additional homework help. Don't wait until the night before class to seek help.
- When seeking help, be prepared to explain your question and what you've tried so far.
- Form a study group with your peers.

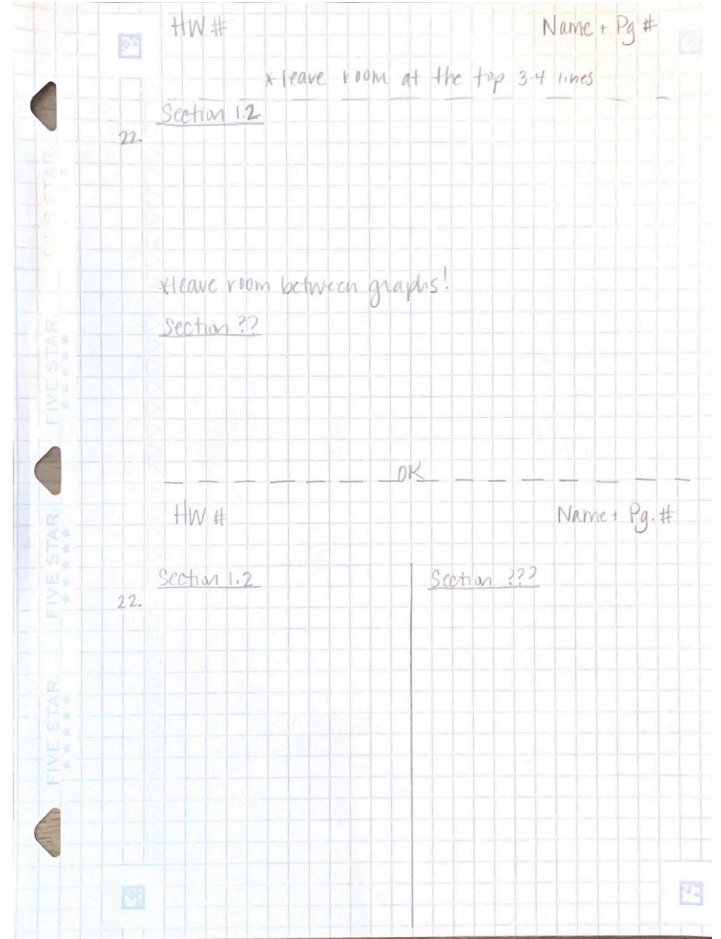
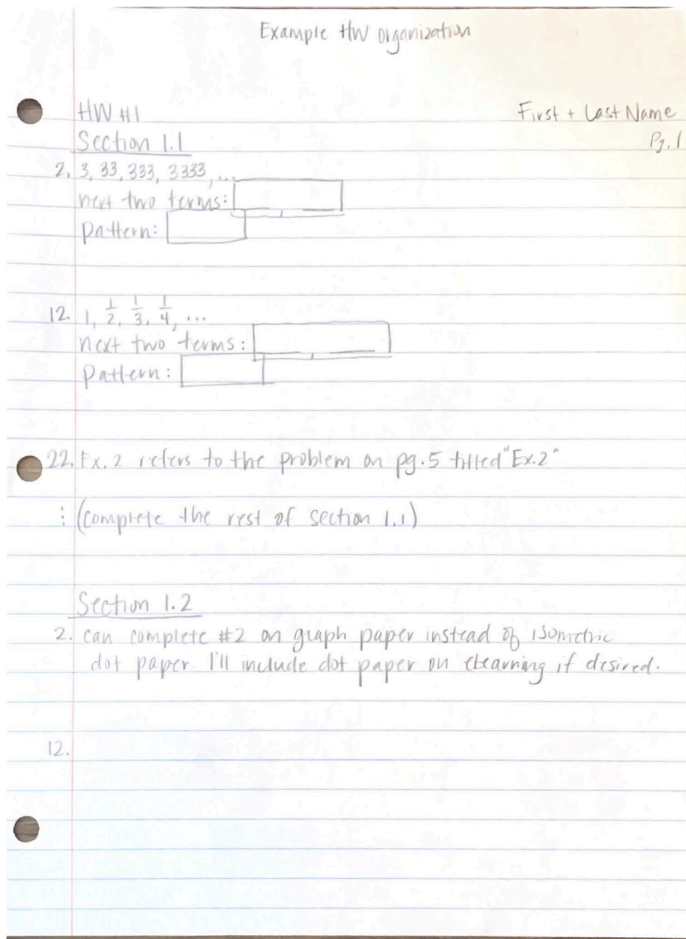
Course Topic Outline (Subject to change, as needed)

- Chapter 1: **Graphs** - Rectangular Coordinates, Graphing Utilities, Introduction to Graphing Equations, Intercepts, Symmetry, Graphing Key Equations, Solving Equations Using a Graphing Utility, Lines, Circles.
- Chapter 2: **Functions and their Graphs** - Functions, The Graph of a Function, Properties of Functions, Library of Functions, Piecewise-Defined Functions, Graphing Techniques: Transformations, Mathematical Models: Building Functions.
- Chapter 3: **Linear and Quadratic Functions** - Linear Functions, Their Properties, and Linear Models, Building Linear Models from Data, Quadratic Functions and Their Properties, Building Quadratic Models from Verbal Descriptions and Data, Inequalities Involving Quadratic Functions.
- Chapter 4: **Polynomial and Rational Functions** - Polynomial Functions and Models, Properties of Rational Functions, The Graph of a Rational Function, Polynomial and Rational Inequalities, The Real Zeros of a Polynomial Function, Complex Zeros, Fundamental Theorem of Algebra.
- Chapter 5: **Exponential and Logarithmic Functions** - Composite Functions, One-to-One Functions; Inverse Functions, Exponential Functions, Logarithmic Functions, Properties of Logarithms, Logarithmic and Exponential Equations, Financial Models, Exponential Growth and Decay Models, Newton's Law, Logistic Growth and Decay Models, Building Exponential, Logarithmic and Logistic Models from Data..
- Chapter 6: **Trigonometric Functions** - Angles and their Measure, Trigonometric Functions: Unit Circle Approach, Properties of Trigonometric Functions, Graphs of the Sine and Cosine Functions, Graphs of the Tangent, Cotangent, Cosecant, and Secant Functions, Phase Shift, Sinusoidal Curve Fitting.
- Chapter 7: **Analytic Trigonometry** - The Inverse Sine, Cosine, and Tangent Functions, Trigonometric Identities, Sum and Difference Formulas, Double-angle and Half-angle Formulas, Product-to-Sum and Sum-to-Product Formulas, Trigonometric Equations.
- Chapter 8: **Applications of Trigonometric Functions** - Right Triangle Trigonometry, Applications, The Law of Sines, The Law of Cosines, Area of a Triangle, Simple Harmonic Motion, Damped Motion, Combining Waves.
- Chapter 9: **Polar Coordinates; Vectors** - Polar Coordinates, Polar Equations and Graphs, The Complex Plane, De Moivre's Theorem, Vectors, The Dot Product, Vectors in Space, The Cross Product.

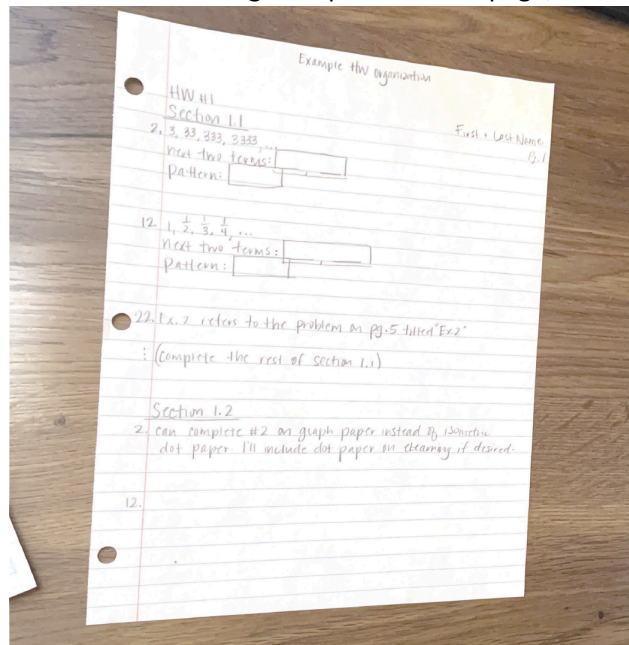
- Chapter 10: **Analytic Geometry** - Conics, the Parabola, the Ellipse, the Hyperbola, Rotation of Axes, General form of a Conic, Polar Equations of Conics, Plane Curves, Parametric Equations.
- Chapter 11: **Systems of Equations and Inequalities** - Substitution, Elimination, Matrices, Determinants, Matrix Algebra, Partial Fraction Decomposition, Systems of Nonlinear Equations, Systems of Inequalities, Linear Programming.
- Chapter 12: **Sequences; Induction; the Binomial Theorem** - Sequences, Arithmetic Sequences, Geometric Sequences, Geometric Series, Mathematical Induction, the Binomial Theorem.
- Chapter 13: **Counting and Probability** - Counting, Permutations, Combinations, Probability.

HOMEWORK EXAMPLES

Good: It is completed in pencil, easy to identify which section and problem, as well as see the answer to problems (boxes) and where one problem stops and the next problem starts.



Bad: - When using the scan feature on your phone it is important to adjust the edges of the paper so your document can be easy to read. Other items to avoid: too much writing cramped onto the page, hard to follow which section/problem.



Precalculus Schedule at a Glance

Tuesday/Thursday - Koch

2023–2024

In addition to assigned problems to be completed, homework also includes reading the new sections to be taught in the coming week. This homework schedule is tentative and subject to change given notice.

Week/Date	New Sections	Homework Sections	Problems	Due
-1. Jan 9/11	Chapter 1	Geometry Final Exam Review Packet	Entire Packet	Jan 16/18
0. Jan 16/18	Geometry Final Exam	Chapter 1: AYP, C&V, SB, A&E, D&W Appendix A.6, A.9: SB, A&E, D&W	2's: 2, 12, 22, ...	Jan 23/25
1. Jan 23/25	Chapter 2	Chapter 1–2: AYP, C&V, SB, A&E, D&W	4's: 4, 14, 24, ...	Jan 30/Feb 1
2. Jan 30/Feb 1	Chapter 3	Chapter 1: A&E, D&W; Chapter 2–3: AYP, C&V, SB, A&E, D&W Appendix A.6, A.9: SB, A&E, D&W	6's: 6, 16, 26, ...	Feb 6/8
3. Feb 6/8	Chapter 4	Chapter 2: SB, A&E, D&W Chapter 3–4: AYP, C&V, SB, A&E, D&W	8's: 8, 18, 28, ...	Feb 13/15
4. Feb 13/15	Chapter 5	Chapter 3: SB, A&E, D&W Chapter 4–5: AYP, C&V, SB, A&E, D&W	2's: 2, 12, 22, ...	Feb 20/22
5. Feb 20/22	Chapter 6	Chapters 1 – 5: Chapter Test, Cumulative Review	Evens	Feb 27/29
6. Feb 27/29	Exam 1	Chapter 4: SB, A&E, D&W Chapter 5–6: AYP, C&V, SB, A&E, D&W	4's: 4, 14, 24, ...	March 5/7
7. March 5/7	Chapter 7	Chapter 5: SB, A&E, D&W Chapter 6–7: AYP, C&V, SB, A&E, D&W	6's: 6, 16, 26, ...	March 12/14
8. March 12/14	Chapter 8	Chapter 6: SB, A&E, D&W Chapter 7–8: AYP, C&V, SB, A&E, D&W	8's: 8, 18, 28, ...	March 19/21
9. March 19/21	Chapter 9	Chapter 7: SB, A&E, D&W Chapter 8–9: AYP, C&V, SB, A&E, D&W	2's: 2, 12, 22, ...	April 9/11
March 25 – April 5 – Spring Break – No New Assignment				
10. April 9/11	Review	Chapters 6 – 9: Chapter Test, Cumulative Review	Evens	April 16/18
11. April 16/18	Exam 2	Chapter 8–9: AYP, C&V, SB, A&E, D&W Appendix A.6, A.9: SB, A&E, D&W	4's: 4, 14, 24, ...	April 23/25
12. April 23/25	Chapter 10	Chapter 9–10: AYP, C&V, SB, A&E, D&W Appendix A.6, A.9: SB, A&E, D&W (0's)	6's: 6, 16, 26, ...	April 30/May 2
13. Apr 30/May 2	Chapter 11	Chapter 10–11: AYP, C&V, SB, A&E, D&W Appendix A.6, A.9: SB, A&E, D&W	8's: 8, 18, 28, ...	May 7/9
14. May 7/9	Chapter 12	Chapter 10: SB, A&E, D&W Chapter 11–12: AYP, C&V, SB, A&E, D&W	2's: 2, 12, 22, ...	May 14/16
15. May 14/16	Chapter 13 (Preview 14?)	Chapter 11: SB, A&E, D&W Chapter 12–13: AYP, C&V, SB, A&E, D&W	4's: 4, 14, 24, ...	May 21/23
16. May 21/23	Wrap Up & Review	Chapters 10 – 13: Chapter Test, Cumulative Review	Evens	May 28/30
17. May 28/30	PreCalculus Final Exam	No Assignment; Happy summer break!		

Homework may come from sections labeled **Assess your understanding: 1) Are You Prepared (AYP), 2) Concepts and Vocabulary (C&V), 3) Skill Building (SB), 4) Applications and Extensions (A&E), and 5) Discussion and Writing (D&W)** as noted.

- **Exam 1** – Feb. 27/29 – Content concentration on Chapters 1 – 5. Expect calculator limitations.
- **Exam 2** – April 16/18 – Content concentration on Chapters 6 – 9. Expect calculator limitations.
- **Final Exam** – May 28/30 – standardized and timed assessment that covers the entirety of Precalculus content standards. Expect calculator limitations on the final exam.