

THE MATH SUCCESS CENTER'S

GUIDE TO STUDYING FOR MATH



2025

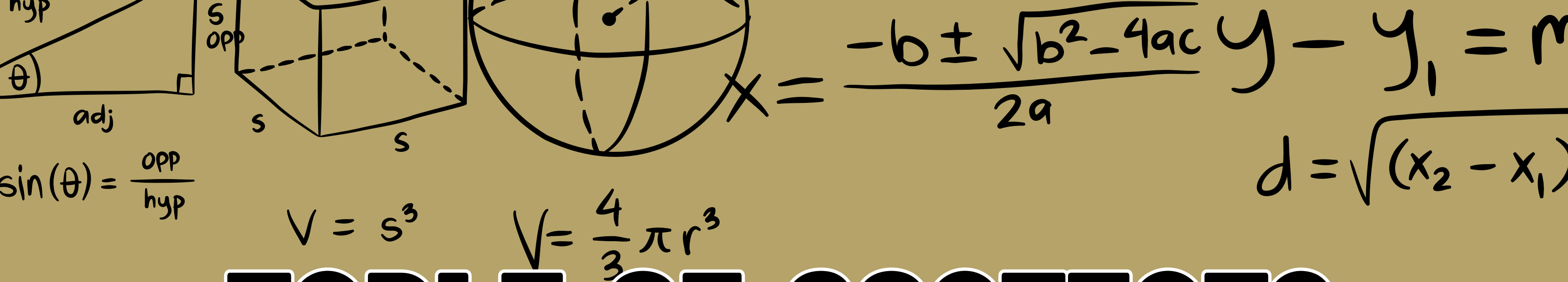


TABLE OF CONTENTS

Mindset p. 2

Methods to Learn/Problem Solve..... p. 3

Methods to Study..... p. 5

Metacognitive Strategies..... p. 6

(Online) Learning Habits..... p. 8

Test Taking Strategy..... p. 10

Technology as Aid..... p. 11

Blank Schedule..... p. 12

Sample Schedule..... p. 13

Works Cited..... p. 14



HOW SHOULD I APPROACH LEARNING MATH?

- **Transition into College Mathematics**

- As you transition into college math courses, you may notice that you are more responsible for your own learning and need to be more active in your learning environment. Because of this, try to figure out a learning strategy that works for you early on.
- A learning strategy can be "any thoughts, behaviors, beliefs, or emotions that facilitate the acquisition, understanding, or later transfer of new knowledge and skills" (Wadsworth et al., 2007). This document provides multiple suggestions for you!
- Because you are responsible for your own learning, you should aim to study 2-3 hours **outside** of class per credit hour in a 16-week semester (a sample schedule is provided on page 11).

- **Make Choices that Help Build your Number Sense and Flexibility!**

- Research shows that first trying to solve the problem with minimal use of technology, including calculators, builds your number sense muscles and helps you solve more complex problems in the future
- Try to approach the problem from multiple angles. Recall and connect what you already know!
 - Using numbers flexibly is a foundation for all higher-level math classes, so try to approach learning math keeping this in mind (Parker, 2015). You should aim to be a "good strategy user" or a "good thinker" (Wadsworth et al., 2007).

- **Visual Representation of Mathematics**

- You can try to represent number facts in your mind visually. Research indicates that combining visual and symbolic representations of numbers enables the brain to utilize different pathways. This will help deepen your learning experience (Parker, 2015).

- **Think About the Way You Talk to Yourself**

- You will learn better if you approach math in a manner you enjoy. Ensure you like your study environment, make yourself a cup of tea or coffee, and try to get as much as possible out of the experience (Parker, 2015).
- Remember, a strong math student isn't necessarily a fast one! (Parker, 2015).
 - Anyone can learn math! There isn't such a thing as a "math person" (Stanford Online, 2014).
 - Negative self-talk is a big part of math anxiety. Maintain a positive growth mindset and avoid getting overwhelmed (Styś, 2022).

METHODS

TO LEARN/PROBLEM SOLVE

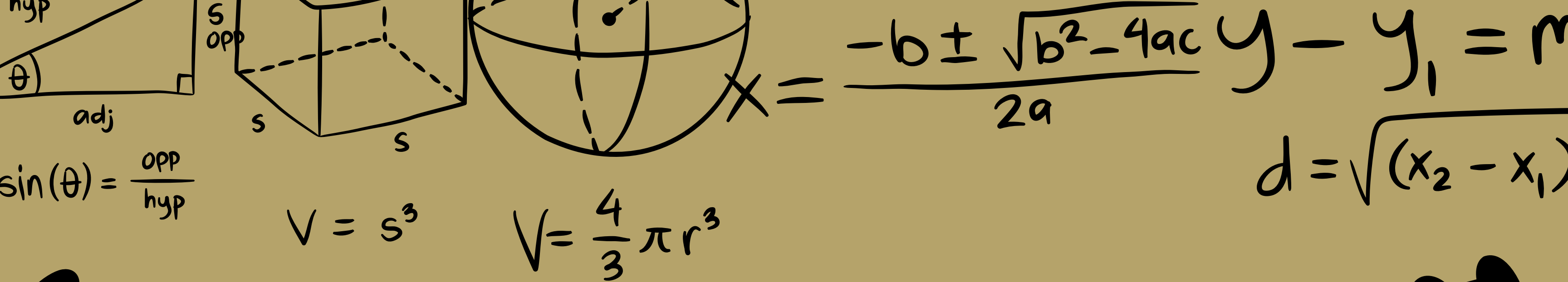
HERE ARE SOME “FORMULAS” YOU CAN TRY!

- “MURDER” Strategy

- **Mood:** Enter the right mindset. Think positively and relax! *Preview* the topic you are working on by familiarizing yourself with the chapters in your textbook or notes from class. Know what information exists where.
 - Remember, even *15 minutes* per day of reading the textbook or notes ahead of class can help!
- **Understand:** Determine the key points in a question before attempting to approach the problem. This process will likely not be instantaneous and will likely take more time than feels initially comfortable. Most mathematicians spend the most time on this step.
- **Recall:** Think back to previous relevant knowledge. It is important to connect old concepts to new ones.
- **Detect and Digest:** Identify areas where you may have knowledge gaps. Work on filling the gaps and re-solve problems you struggled with.
- **Expand:** Connect math problems to real-life scenarios AND other aspects of math/science/business you have studied. Contextualizing problems you’re working on will make them seem more relevant and interesting!
- **Review and Respond:** Review what you’ve learned to ensure you’ve a thorough understanding of it (Behzadi, 2014). You can try teaching the concept to a person, a cat, or an imaginary friend as a temperature check.

- Pólya's Four-Step Process:

- **Understand the problem:** Try to identify precisely which quantity the problem is asking you to find or solve for (make sure you read the whole problem).
- **Devise a plan:** Identify the skills and techniques you have learned that can be applied to solve the problem at hand. This is the longest and most difficult step, so take your time.
- **Carry out the plan:** Using the skills you have identified, actually solve the problem. Remember, sometimes your plan may not work right away, so become comfortable revising it as needed.
- **Look back:** Does the answer you found seem reasonable? Also, make sure you review the problem and method of solution so that you can more easily recognize and solve a similar problem (Pólya, 1945).



WORD/APPLIED PROBLEMS

- The first step is actually understanding what the problem is asking.
 - A strategy you can try is “brain dumping” every piece of information that seems like it MAY be important.
 - Underline necessary quantities and phrases in the problem.
- Then, start to draw out a picture and label it with all the quantities or variables mentioned in the problem.
- Now, identify the goal of the problem and which pieces of information ARE important.
- Find equations that describe the relationships among the variables and describe the goal of the problem mathematically.
- Solve the problem (consider the strategies above).
- Now convert the mathematical answer you have found back into words. Make sure to answer in a complete sentence (Department of Mathematics and Statistics Saint Louis University, 1993).



SEE WHICH OF THESE WORKS FOR YOU:

○ Practice Testing

- This is one of the most valuable tips on this list and has been proven to be the most effective (Dunlosky, 2013).
- Self-test practice tests on the material you've learned. You can use a teacher-provided practice test or make your own (Dunlosky, 2013)!
- Use past homework problems to create a practice test (re-do EVERY homework problem).
- Try to simulate a testing environment to the best of your abilities. Turn off any screens, only use the same technology you'll be permitted on an exam, and time yourself.

○ Distributed Practice

- Create a study schedule that spreads out your studying over time; this will help you learn more effectively. Don't try to cram it all at once; it isn't effective (Dunlosky, 2013)!

○ Interleaved Practice

- Review different types of material/problems in one study session. This will enable your brain to engage actively in the learning process.

○ Elaborative Interrogation/Self-Explanation

- Try explaining out loud to yourself or to a friend why a concept is true, and the methods you used to solve a problem (Dunlosky, 2013).

○ Do Textbook/Lecture Examples

- Work through textbook/lecture examples. Use the given solutions to verify your answers (after completing the questions). If you made a mistake, ensure you understand how to do it correctly and review the relevant parts of the textbook or lecture notes.
- Don't just do the homework at the beginning of the textbook. Instead, do a selection of problems, as they get harder as you go.

○ Write out Mathematical Procedures

- Practice makes perfect, and writing down your steps will help you remember them more effectively.

○ Do Quiz and Test Corrections

- Concepts that appear on quizzes will often reappear on tests. Make sure you understand where you made mistakes (Tutoring and Testing Center Nova Southeastern University, 2006).
- Remember, this is good practice even if it's not for points!

○ Active Study

- Take responsibility for your own studying. You are responsible for knowing what you do and don't understand, and asking for help when needed (Department of Mathematics and Statistics, Saint Louis University, 1993).

METACOGNITIVE STRATEGIES

THINKING ABOUT THINKING

- It is essential to reflect on what is working in your studying and adjust as necessary. Here are some resources on how to build good study habits:
 - Bloom's Taxonomy:** The pyramid illustrates the various levels of thinking employed when learning. Notice how each level builds on the foundation that precedes it. It is essential that we master the lower levels before we can effectively apply the skills above.

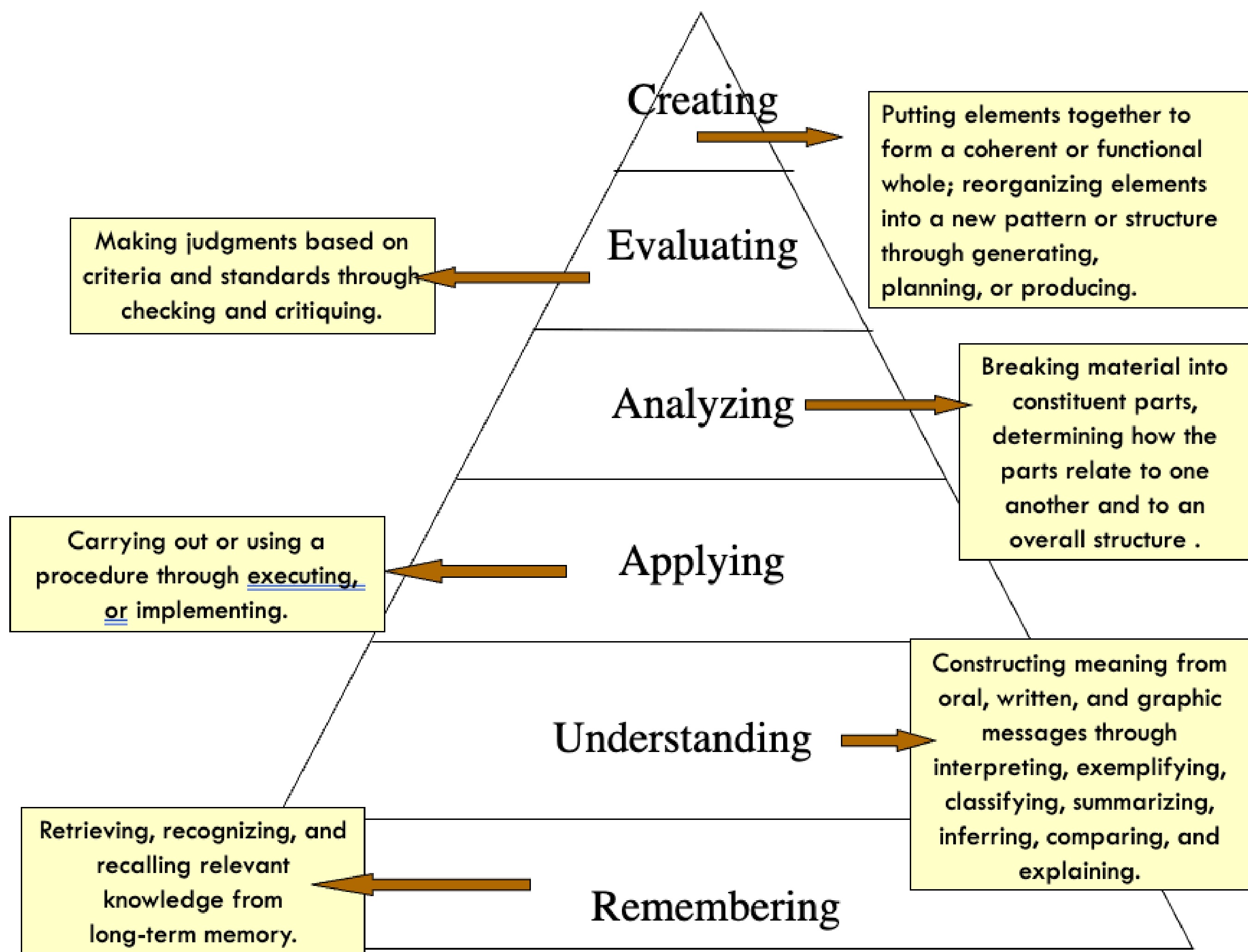
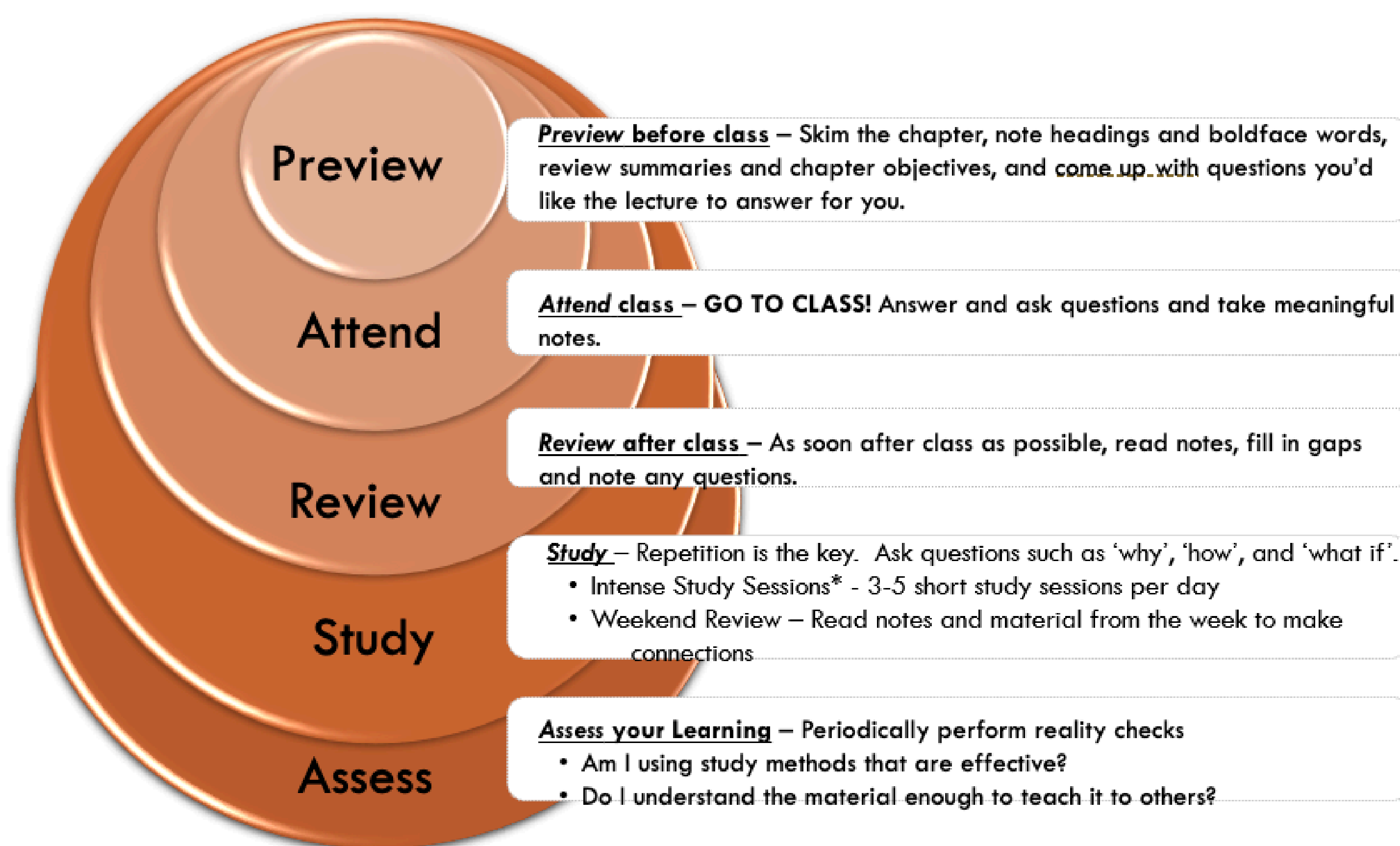


Figure from Erin Martin, Department Chair, Mathematics, Computer Science, and IT at Lindenwood University (adapted with permission from Sandra Y. McGuire, Ph.D. Professor, Department of Chemistry Past Director, Center for Academic Success Louisiana State University)

$\sin(\theta) = \frac{\text{opp}}{\text{hyp}}$
 $V = s^3$
 $V = \frac{4}{3}\pi r^3$
 $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $y - y_1 = m(x - x_1)$
 $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

- A **Study Cycle** might look like this:



*Intense Study Sessions

1	Set a Goal	(1-2 min)	Decide what you want to accomplish in your study session
2	Study with Focus	(30-50 min)	Interact with material- organize, concept map, summarize, process, re-read, fill-in notes, reflect, etc.
3	Reward Yourself	(10-15 min)	Take a break– call a friend, play a short game, get a snack
4	Review	(5 min)	Go over what you just studied

Figure from Erin Martin, Department Chair, Mathematics, Computer Science, and IT at Lindenwood University (adapted with permission from Sandra Y. McGuire, Ph.D. Professor, Department of Chemistry Past Director, Center for Academic Success Louisiana State University)

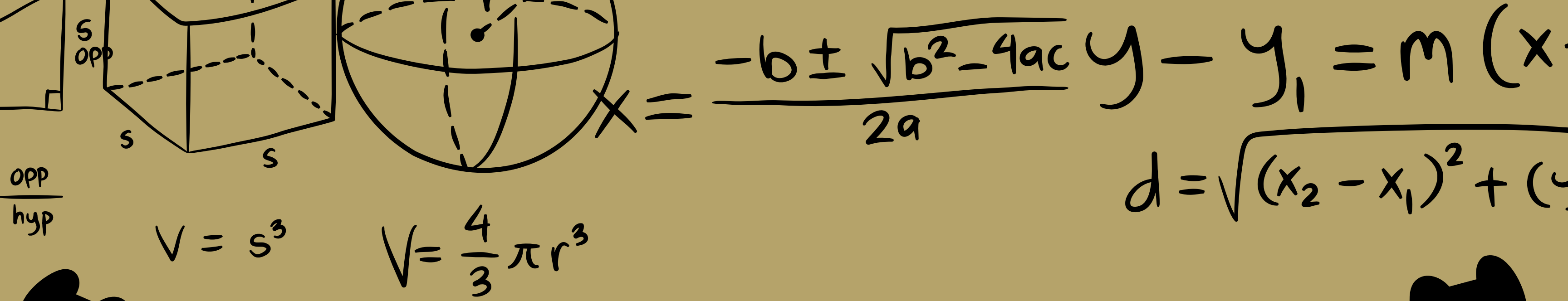


The header features a collage of mathematical concepts: a right triangle with labels 'hyp', 'adj', 'opp', and angle θ ; the sine ratio $\sin(\theta) = \frac{opp}{hyp}$; the volume formula $V = s^3$; the quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$; and the distance formula $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$. Two black pushpins are pinned to the left and right sides of the header.

(ONLINE) LEARNING HABITS

TO PRACTICE

- As a web-based learner, you must become accustomed to a structured learning environment, even though you are not in a traditional classroom setting (Wadsworth et al., 2007). Use the following ideas:
 - **Make a Study Schedule**
 - Studying should be a regular part of your life, so make sure to set aside some time for it. Consider using the attached timetable to plan out your studying (page 10 and 11).
 - **Have a Designated Mathematics Notebook**
 - Having a designated place to store all of your notes will help you be more organized and prepared.
 - Take initial notes on the provided videos and lectures, and then spend a few minutes summarizing the notes afterward. Be sure to do a similar process when completing your homework.
 - **Read your Textbook Before watching the Videos or doing the Homework**
 - Learn any vocabulary or formatting that will be discussed in class. Having some background knowledge ahead of time will allow you to gain more from the lecture (Tutoring and Testing Center Nova Southeastern University, 2006).
 - **Watch all the Videos and take Active Notes**
 - It's important to stay engaged during online learning.
 - **Find a Quiet Place to Study**
 - Being in an environment that allows you to focus on math fully will help you be more productive.
 - **Form Study Groups**
 - Consider emailing your classmates or exchanging phone numbers to coordinate TEAMS study sessions outside of class time.
 - Arrive at meetings with your peers prepared and ready to ask questions. Learn from one another and teach each other valuable skills!
 - **Use Auxiliary Materials** (Tutoring and Testing Center Nova Southeastern University, 2006)
 - Take advantage of all the resources available to you at the Math Success Center (such as free tutoring).
 - **Establish a Routine, despite working from Home**
 - Start your day as if you were physically attending class. Wake up at set times, eat breakfast, and get ready for the day. Maintaining a structure in your life will signal to your brain when it's time for work and when it's time to relax.
 - **Dedicate a Study/Learning Space in your Home**
 - This will contain any academic stress in one area of your home. Having a designated workspace will enable you to focus more effectively.
 - **Avoid Multi-Tasking**
 - Multi-tasking will only hinder your learning and will have negative impacts on your performance in the class (Wood et al., 2012).
 - **Take Breaks + Get Moving**
 - Staring at your screen for prolonged periods of time can be exhausting. Stand up and stretch every couple of hours (University of Illinois Urbana-Champaign, n.d.).



HOW TO ASK FOR HELP

- **Resources you can access:**

- Ask questions in class.
- Go to office hours. Instructors will appreciate that you showed initiative.
- Reach out to people in your study group.
- Go to tutoring on campus or online through the Math Success Center (Department of Mathematics and Statistics, Saint Louis University, 1993).

- **What makes a good question?**

- Be specific. Stay away from comments like "I don't understand this section". Show your instructor that you have made an effort to understand the material. Your questions should focus on your own thought process.
- Here are some examples of good questions/comments:
 - I don't understand why $f(x + h)$ doesn't equal $f(x) + f(h)$.
 - This is how I tried to do #17. What went wrong (Department of Mathematics and Statistics, Saint Louis University, 1993)?

- **Be prepared to control the help that you get**

- Helpers should be coaches, not crutches. They should encourage you, provide hints as needed, and occasionally show you how to solve problems. But they aren't there to do the work for you.
- When you attend office hours with your study group or tutor, have a specific list of questions prepared in advance. You should take advantage of the session as much as possible by asking questions that suit your needs (Department of Mathematics and Statistics, Saint Louis University, 1993).



The background features several mathematical elements: a right triangle with labels 'adj', 'opp', 'hyp', and angle θ ; a cube with side length s and volume $V = s^3$; the quadratic formula $-b \pm \sqrt{b^2 - 4ac}$; the distance formula $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$; and a sine wave.

TEST TAKING STRATEGY

TEST TAKING BY ITSELF IS A GOOD SKILL TO CULTIVATE!

- **Look over the entire test:**
 - This will allow you to gauge the length of the test, and make a plan for tackling the whole exam.
- **Do the problems in the order that suits you:**
 - **Start** with problems you are confident in to build your morale. Additionally, this will ensure you don't miss points simply because you ran out of time. Then, attempt the more complicated problems.
- **Keep track of Time:**
 - Work quickly but write legibly, and be sure to show all your work.
 - If you get stuck on a problem, move on and come back to it later.
- **Show all your work:**
 - Try to show the instructor everything you know.
 - Even if your answer is incorrect, the Instructor will assign partial credit based on the work you show. So write down your whole thought process.
- **Don't waste time erasing:**
 - Draw a line through your work instead. This will save time, and it may be helpful later on in terms of content or receiving partial credit.
- **In a multiple-step problem, outline the steps before actually working the problem:**
 - Even if you can't do the first part of the problem, continue on with explaining how to do the other ones (even if the solution depends on the first question).
- **Read the questions carefully and do all parts of each problem:**
 - Double-check that your answer makes sense in the context of the problem (Department of Mathematics and Statistics, Saint Louis University, 1993).
 - If you finish early, check every problem by reworking everything from scratch.

TECHNOLOGY AS AID

- You can get unlimited practice problems of particular topics with answers on **Wolfram Alpha's Problem Generator**
 - <https://www.wolframalpha.com/problem-generator/>
- If you choose to use AI tools like ChatGPT or Perplexity, please check with your instructor for the class guidelines. In the context of most math classes, it should not be used to substitute any work that you are supposed to do, but it could be used as a tool to help you create resources to study. Try the **prompts** below **to generate practice tests and problems** (make sure to provide the AI with examples from your class):
 - "Given my class notes/study guide, write me a practice test in this style [specify length, type of question, topics, etc]."
 - "Given the following type of question [on a given topic], generate problems that test me on this skill."
 - Make sure to remind the AI: "Do not initially give me the answers."
 - **Caution:** ChatGPT and Perplexity are large language models and may not accurately verify solutions (Wolfram Alpha is better suited for this purpose).
- **Remember:** Tests and quizzes are SOLO. Technology cannot be a crutch. Use technology as a tool to check your work or generate practice problems, NOT to substitute thinking.
 - Over-reliance on AI tools actually prevents you from building the connections in your brain necessary to form all the neural pathways needed to tackle complex problems (Kosmyna et al., 2025)

BLANK SCHEDULE

Day/Time	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
7:30-8:00							
8:00-8:30							
8:30-9:00							
9:00-9:30							
9:30-10:00							
10:00-10:30							
10:30-11:00							
11:00-11:30							
11:30-12:00							
12:00-12:30							
12:30-1:00							
1:00-1:30							
1:30-2:00							
2:00-2:30							
2:30-3:00							
3:00-3:30							
3:30-4:00							
4:00-4:30							
4:30-5:00							
5:00-5:30							
5:30-6:00							
6:00-6:30							
6:30-7:00							
7:00-7:30							
7:30-8:00							
8:00-8:30							
8:30-9:00							
9:00-9:30							
9:30-10:00							
10:00-10:30							
10:30-11:00							
11:00-11:30							
11:30-12:00							
12:00-12:30							

SAMPLE SCHEDULE

7 AM	Free Time, Breakfast,	Free Time, Breakfast,	Free Time, Breakfast,	Free Time, Breakfast,	Free Time, Breakfast,	Free Time, Breakfast,	Free Time, Breakfast,
8 AM	BSC22700 Study 8am – 12pm	BSC24800 8 – 9am	BSC24800 8 – 9am	BSC24800 8 – 9am	BSC24800 8 – 9am	BSC24800 8 – 9am	Service Job 8am – 3pm
9 AM		MTH15200 9 – 9:50am		MTH15200 9 – 9:50am		MTH15200 9 – 9:50am	
10 AM		BSC22700 10 – 10:50am	CHM23200 9:30 – 10:50am	BSC22700 10 – 10:50am	CHM23200 9:30 – 10:50am	BSC22700 10 – 10:50am	
11 AM		BSC24800 11am – 12pm	CHM24200 11am – 1:30pm	BSC24800 11am – 12pm	CHM23200/CHM24200 Study 11am – 1pm Chemistry Tutoring	BSC24800 11am – 12pm	
12 PM	Free Time 12 – 7pm	BSC24800 12 – 12:50pm		BSC24800 12 – 12:50pm		BSC24800 12 – 12:50pm	
1 PM		Lunch 1 – 1:45pm	Lunch 1:30 – 2:30pm	Lunch 1 – 1:45pm	Lunch 1:30 – 2:30pm	Lunch 1 – 1:45pm	
2 PM		BSC22700 2 – 4:30pm	MTH15200 Study 2:30 – 5:30pm Math Success Center	BSC22700 2 – 4:30pm	MTH15200 Study 2:30 – 5:30pm	Service Job 2 – 7pm	
3 PM							Lunch, 3pm
4 PM							Free Time 3:30 – 7pm
5 PM		Service Job 5 – 8pm	BSC22700 Study 5:30 – 7pm	BSC22700 Study 4:30 – 7pm	CHM23200 5:30 – 6:30pm		
6 PM							
7 PM	Workout 7 – 8pm		Workout 7 – 8pm	Workout 7 – 8pm	Workout 7 – 8pm		Workout 7 – 8pm
8 PM	Dinner 8 – 9pm	Dinner 8 – 9pm	Dinner 8 – 9pm	Dinner 8 – 9pm	Dinner 8 – 9pm	Dinner 8 – 9pm	Dinner 8 – 9pm
9 PM	Free Time 9 – 11pm	CHM23200 9 – 10pm	CHM23200 9 – 10pm	CHM23200 9 – 10pm	CHM23200 9 – 10pm	CHM23200 9 – 10pm	Free Time 9 – 11pm
10 PM		Free Time 10 – 11pm	Free Time 10 – 11pm	Free Time 10 – 11pm	Free Time 10 – 11pm	Free Time 10 – 11pm	
11 PM							

WORKS CITED

- Behzadi, M., Lotfi, F., & Mahboudi, N. (2014). The Study of Teaching Effective Strategies on Students Math Achievements. *Mathematics Education Trends and Research*. 10.5899/2014/metr-00040
- Department of Mathematics and Statistics Saint Louis University (1993). Success in Mathematics.
- Dunlosky, J. (2013). Strengthening the Student Toolbox: Study Strategies to Boost Learning. *American Educator*, 37(3), 12-21.
- How to Learn Math: For Students*. Stanford Online. (2014).
<https://online.stanford.edu/courses/gse-yeduc115-s-how-learn-math-students>
- Kosmyna, N., Hauptmann, E., Yuan, Y. T., Situ, J., Liao, X.-H., Beresnitzky, A. V., Braunstein, I., & Maes, P. (2025). *Your Brain on ChatGPT: Accumulation of Cognitive Debt When Using an AI Assistant for Essay Writing Task*. [Manuscript in preparation].
- Online Learning Tips*. University of Illinois Urbana-Champaign. (n.d.).
<https://netmath.illinois.edu/online-learning-tips>
- Parker, C. (2015, January 29). *Research Shows the Best Ways to Learn Math*. Stanford Graduate School of Education.
<https://ed.stanford.edu/news/learning-math-without-fear>
- Pólya, G. (1945). *How to Solve It*. Princeton University Press.
- Styś, M. (2022, March 15). *How to Study Math: Tips and Resources to Help you Conquer Your Fear of Mathematics*. Medium.
<https://wavelearningfestival.medium.com/how-to-study-math-tips-and-resources-to-help-you-conquer-your-fear-of-mathematics-17ed0fc31239>
- Tutoring and Testing Center Nova Southeastern University (2006). *Tutoring, 2006*. <https://www.nova.edu/tutoring-testing/study-resources/forms/study-skills-guide.pdf>
- Wadsworth et al., L. M., Husman, J., Duggan, M. A., & Pennington, M. N. (2007). Online Mathematics Achievement: Effects of Learning Strategies and Self-Efficacy. *Journal of Developmental Education*, 30(3), 6.
- Wood, E., Zivcakova, L., Gentile, P., Archer, K., De Pasquale, D., & Nosko, A. (2012). Examining The Impact of Off-Task Multitasking with Technology on Real-Time Classroom Learning. *Computers & Education*, 58(1), 365-374.