

Math Attitudes Survey 1

1. In general, how do you feel about mathematics and your math ability?
2. Why do you feel the way you do about mathematics? What experiences led you to develop your attitude and feelings about math?
3. How would you describe yourself as a math student? What are your strengths and challenges with math?
4. In your opinion and experience, what are the characteristics of a “good” math student?
5. If you do not understand a math concept or problem, what do you do?
6. What do you do to remember math concepts?
7. Complete the following statement.

I enjoy mathematics when

8. What kind of math do you use

 - a. At home?

 - b. At school?

 - c. At work?

 - d. At play?

9. Think about what you would like to learn from this course to help you become a better math student. List one or two goals that you would like to set for yourself to accomplish in this course. (Note: Do not write that your goal is to pass the course; be specific about what you want to focus on in relation to mathematics.)

10. How will passing this class make you feel?

11. What have you learned or accomplished that was difficult for you? (This can be related to school, work, family, sports, etc.) What strategies did you apply when you faced challenges in learning or accomplishing this thing? How can you apply those strategies to this course?

Math Attitudes Survey 2

Review your responses to the Math Attitudes Survey 1 that you prepared at the beginning of the semester. Reflect on any changes that have occurred this semester. Answer each question thoroughly.

1. Has your attitude toward math changed? Explain.
2. Do you describe yourself as a math student any differently? Explain.
3. What changes you have made in how you learn math and remember math concepts? How have your study strategies changed?
4. If you do not understand a math concept or problem, what do you do?
5. Complete the following statement.

I enjoy mathematics when
6. Re-examine the goals you identified in your first survey. How are you progressing toward your goal(s)? Do you have any new goals that you would like to add? If so, state them.

Math Attitudes Survey 3

Review the work you have completed this semester. Reflect on any changes to your approach and attitudes to this course that have occurred this semester. Answer each question thoroughly.

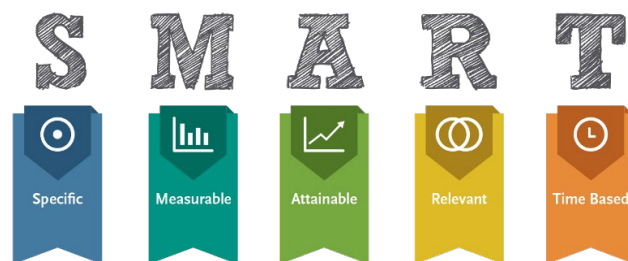
1. Has your attitude toward math changed at all this semester? Explain.
2. Do you describe yourself as a math student any differently? Explain.
3. What have you accomplished this semester in relation to mathematics?
4. Complete the following statement.

I enjoy mathematics when
5. Identify at least one math-related goal that you would like to focus on after this course.
6. What was your favorite math concept you learned this semester?
7. What connections did this course have with any of your other courses or other areas of your life?

“Setting goals is the first step in turning the invisible into the visible.” ~Tony Robbins

1. Whom do you dream of becoming? What is your lifelong goal?
2. It can be difficult to set goals by looking forward because we often see all the challenges in front of us. Imagine yourself in the future having accomplished your goal. Now think backward. What had to happen for you to reach that goal?
3. Is completing your degree required to accomplish your goal? If so, what had to happen for you to complete your degree?
4. Is completing this course a requirement to completing your degree? If so, what had to happen for you to complete this course?

The SMART framework is a method for writing goals that are specific, measurable or meaningful, attainable, relevant, and time-based - review [SMART Goals](#) for more information.



5. Write two or three SMART goals that will help you complete this course and, therefore, advance your lifelong dream?

Goal Setting Worksheet

Set some specific goals at the **BEGINNING** of your course.

1. I hope to get a grade of _____ in this course.
2. Three things I can do to ensure that I meet this goal are
 - a.
 - b.
 - c.
3. I plan to spend _____ hours per week *outside* of class for this course.
4. Three things I can do to ensure that I have enough time to devote to math are
 - a.
 - b.
 - c.
5. At most, I will miss _____ classes this semester.
6. Three things I can do to ensure that I get to class each time it meets are
 - a.
 - b.
 - c.

Goal Setting Worksheet

Evaluate your goals at the **MIDPOINT** of your course.

1. My grade is currently _____.
2. Am I on target to reach my grade goal? yes/no
3. Can I still attain my goal? yes/no
4. My grade goal at this point is _____.
5. Three things I can do to ensure that I meet this goal are
 - a.
 - b.
 - c.

Goal Setting Worksheet

Reflect on your goals at the **END** of your course.

1. The grade I earned in this course is _____.
2. Did I meet my initial grade goal? yes/no
3. Did I meet my midpoint grade goal? yes/no
4. What are three things that I did that contributed to my course grade?
 - a.

 - b.

 - c.
5. What are three things that I did *not* do that contributed to my course grade?
 - a.

 - b.

 - c.
6. Did I meet my attendance goal? Why or why not?
7. Was I able to budget appropriate time for this course? yes/no
8. What more do I need to do to prepare for my next course?

The Forgetting Curve



STUDY WITH PURPOSE

Learning math is similar to learning a foreign language; it requires knowing how to speak, read, and write the "language" fluently to communicate and understand the concepts effectively. Learning new ideas can be complex and challenging, but this is essential for learning to take place. Educators often refer to this struggle as a *productive struggle* or a *desirable difficulty*.



Figure 1. A student overwhelmed with her studies. [1]

There are scientifically proven methods that you can apply to learn new material. The *Study with Purpose* lessons will present several of these throughout the course. One of these methods is *spaced repetition*. **Spaced repetition** is a learning process that increases intervals of time between the reviews of previously learned material. If we fail to revisit a new skill regularly, we will forget that skill. For learning to take place, forgetting must be interrupted.

The Curve of Forgetting (Figure 2) shows the percent of material retained each day after learning a topic. Notice that three days after learning a concept, we forget nearly half of the information if we do not review it. However, the graph shows that we retain almost 90% of what we learned after a week just by studying the material a few moments over several days.

Typical Forgetting Curve for Newly Learned Information

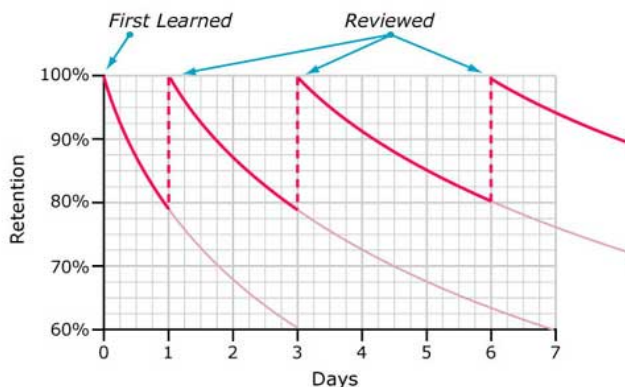


Figure 2. The curve of forgetting. [2]

Without deliberately practicing and reviewing newly learned topics, forgetting will take place.

When we regularly review previously learned concepts, we eventually need to devote only five to ten minutes each day to retain these concepts. This review time decreases to only a couple of minutes per day by day 30. Read the [University of Waterloo's explanation on the Forgetting Curve](#) for more information on this concept.

STUDY WITH PURPOSE



THINK ABOUT IT!

Think About It: The Forgetting Curve

Discuss some specific ways that you can put the Curve of Forgetting information into action to learn the material in this course.

THINK ABOUT IT!

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[2] [Image](#) courtesy of Kevin Cople at ellaz.com

Post-Test Reflection

Tests are a great way to get a snapshot of where you are in the course at that moment. It is also an excellent opportunity to reflect and implement a growth mindset! Answer each question thoroughly.

1. Review your Test Preparation Log for this exam. What activities and methods did you use to prepare for the test? How many days in advance did you start studying? What was your total study time for the test? What was your study environment? Did you tend to study alone or in a group?
2. How would you evaluate the effectiveness of your test preparation?
3. Review your graded exam. What kinds of mistakes did you make? Were they careless mistakes, concepts you struggled with, you ran out of time, or something else? If the errors were conceptual, list the related topics.
4. Using a growth mindset and looking forward, how will you prepare for the next test? Will you continue using the strategies that you implemented for this exam? What different activities will you use?

Remember that tests are opportunities to retrieve information from our brains. Continue using strategies that solidify the paths to that information in your long-term memory.

Test Preparation Log

As you prepare for the upcoming exam, keep a record of the dates and times you study, the activities you complete during this period, and the topics you studied. Activities can include rereading notes, highlighting notes, working on problems from previous homework assignments, completing a test review, watching videos, reviewing flashcards, creating and working on a practice test, reviewing previous tests, and others. Also, note if you studied alone or in a group.

Date	Start Time	Activities Completed and Topics Studied	Alone/Group	End Time	Total Study Time
Total Time Preparing for Test					

What topics, if any, are still confusing or unclear?

How prepared do you feel for the exam?

Remember that tests are opportunities to retrieve information from our brains. Continue using strategies that solidify the paths to that information in your long-term memory.

Managing Your Time

Time management is the effective use of your time that enables you to plan your days so that you finish your work with less effort and more efficiency. Time is a science; there are a set number of hours in our day. We have to be explicit and clear about what can fit in those hours. We often think of time as a feeling, which can lead to planning fallacy causing us to underestimate the time it takes to do something.

- 1) Do you tend to underestimate how much time it will take you to complete a task?
- 2) Do you find yourself thinking, “I’ve got plenty of time to do a certain task,” only to find you needed more time?
- 3) Do you typically wait to start a task until the last minute? Does procrastination make you think you work well under pressure?
- 4) What are some benefits of effective time management?
- 5) Complete the weekly schedule on the next page. Be sure to schedule everything.
 - a. Add non-moving commitments (work, classes, family obligations)
 - b. Add transition times (drive time, walking to class)
 - c. Add time to complete administrative tasks (email, errands)
 - d. Add time for self-care (sleep, meals, exercise, personal hygiene)
 - e. Add study times
 - f. Other activities
- 6) Now, reflect on your schedule. Do you have sufficient time outside of class and work to make this class a priority? Are there activities you engage in that are not advancing you to your goals? If so, how would giving these up free you to devote to things that are?
- 7) Now, let us put a monetary value on class time and compute the average cost of class per hour.
 - a. Credit hours of the course: _____
 - b. Cost per credit hour: _____
 - c. Total cost of course: _____
 - d. Number of total class meetings: _____
 - e. Cost of course per class meeting: _____
 - f. Number of hours course meets each class period: _____
 - g. Total hours course meets in a semester/quarter: _____
 - h. Average cost of course per hour of class over the semester: _____

Weekly Schedule

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
12:00 AM							
1:00 AM							
2:00 AM							
3:00 AM							
4:00 AM							
5:00 AM							
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Polynomial and Rational Inequalities

A strategy from learning science for retaining material is to write a summary of things you have learned and to note how this new information relates to previous concepts. Take a few moments to answer each question or write your own summary of what you have learned from this section.

- a. What are boundary numbers as they relate to polynomial and rational inequalities?

- b. How can you solve a polynomial inequality by hand?

- c. How can you solve a polynomial inequality using the graph of the corresponding polynomial function?

- d. How can you solve a rational inequality by hand?

- e. How can you solve a rational inequality using the graph of the corresponding rational function?

- f. How do you determine if the boundary numbers are included in the solution set of a polynomial and rational inequality?

- g. How can you connect the concepts in this section to previous topics you have learned?

Maps, Memory, and Math



- 1) What is a place (accessible by driving) that you have never been to but would love to vacation there?
- 2) Suppose that you are going to take a driving vacation to visit this location. How will you determine the route to get to your destination? When you are there, how will you find the grocery store, restaurants, and other venues?
- 3) After one year, you plan to revisit this destination. Do you think you will be able to drive to the location without using your Maps app? Do you think some things will look familiar as you go to the place? Will you remember how to get to different points of interest in your vacation spot?
- 4) What would it take you to be able to drive to your selected destination without any assistance? How familiar would you be with the town and its venues? What benefit would that serve you?
- 5) How is learning a new skill in math similar to visiting a new destination?
- 6) To be able to retrieve a fact from your memory, what is required?

