

Mth 111 Writing Assignment I

To be mathematically literate it is imperative that you be able to effectively communicate mathematical concepts in a written fashion using correct mathematical notation. This assignment is one step in helping you become more mathematically literate.

We have learned to solve linear equations using algebraic manipulation and we have learned to solve quadratic equations using the quadratic formula. But sometimes a real-world problem requires us to solve equations that are too complicated for either of those techniques. In such cases, we can use the graphing calculator. There are two graphic solution methods; The Root Method (using roots) and The Intersection Method (using intersections).

Assignment

Suppose we need to solve an equation of the form $f(t) = g(t)$. Your task is to write a paper which outlines one of the graphic solution methods as a General Procedure. Then demonstrate the method you've chosen with the Specific Example provided here.

Your paper must follow the guidelines given below. It will be graded on presentation, completeness, accuracy, punctuality and approach to the problem. It will be graded using the attached rubric which should be attached to your paper when submitted.

Guidelines

- Your paper must be typed or neatly handwritten and fit entirely on one side of one page.
- There should be a **Title** and at least 4 distinct sections: **Introduction**, **General Procedure**, **Specific Example** and **Conclusion**.
- Your **Introduction** should include some human interest to motivate the purpose of solving equations graphically.
- Your **Introduction** should include a clear problem statement (your paper's purpose) *in your own words* so that someone not familiar with this assignment would understand the purpose of the paper.
- The **General Procedure** must assume the equation to be solved begins in the general form $f(t) = g(t)$.
- The **General Procedure** must clearly describe the solution process in general terms that would apply to any equation.
- The **General Procedure** must clearly describe how to handle the choice of independent variable.
- The **General Procedure** must clarify what one should do if a solution is not initially visible.
- The **General Procedure** must clarify what one would see if no solution exists.
- The **General Procedure** must clarify how to find multiple solutions if they exist.
- Although your paper should include some calculator instructions, those instructions should be general in nature and pertain to any brand of calculator. We do **NOT** want an extensive description of particular calculator steps.
- Your paper must contain at least one well placed diagram that is appropriately labeled and enhances your explanation.
- To clarify the solution process, your paper must contain the following **Specific Example**. The **Specific Example** should coincide directly with your **General Procedure**.
- The Specific example should solve the following equation:
$$\frac{t^3 - 20t^2 - 400t + 4000}{1000} = \frac{24 - t}{4}$$
- This page must be stapled to your writing assignment. However, all pertinent information should be on your written page.

OVERALL FORMAT- Layout/Organization/Presentation

6 pts *Typed with clearly readable font or neatly handwritten. Uses title and other clarifying headings. Layout and information organization/presentation flows for easy readability.*

0 pts *Readability is significantly hindered by font type, handwriting, layout and/or information presentation.*

- | | | | |
|--------------------------|--|--------------------------|--------------------------------------|
| <input type="checkbox"/> | Title, Use of Headings | <input type="checkbox"/> | Appropriate / Clear Notation |
| <input type="checkbox"/> | Section Breaks Apparent | <input type="checkbox"/> | Appropriate Layout of Multiple Steps |
| <input type="checkbox"/> | Appropriate use of White Space | <input type="checkbox"/> | Spelling / Grammar |
| <input type="checkbox"/> | Easy on the Eyes / Overall Readability | <input type="checkbox"/> | Appropriate for Audience |
| <input type="checkbox"/> | Clear Well Placed Diagram(s) | <input type="checkbox"/> | Fits on One Page |

INTRODUCTION

2 pts *Clear, easy to read. Provides motivation, includes clear problem statement and flows naturally into the General Procedure. Makes the reader want to continue reading. Diagrams enhance Introduction.*

0 pts *Quite confusing / disorganized. Motivation missing or unclear. Problem statement missing, awkward or incorrect. Makes the reader want to tear out their hair (even if they are already bald).*

- | | | | |
|--------------------------|---------------------------------------|--------------------------|--|
| <input type="checkbox"/> | Human Interest Included and Appealing | <input type="checkbox"/> | Overall Readability |
| <input type="checkbox"/> | Clear Problem Statement | <input type="checkbox"/> | Smooth Transition to General Procedure |

GENERAL PROCEDURE

7 pts *Interpretation and explanation of mathematical concepts is clear, correct and easy to follow. The Procedure is implemented correctly. It is written in general terms and flows naturally into the Example. Charts/diagrams enhance the paper. Correct function notation is used.*

0 pts *Interpretation and explanation of mathematical concepts is not explained in general terms or the explanation is so confusing it suggests significant misunderstanding. The reader is now screaming.*

- | | | | |
|--------------------------|------------------------------------|--------------------------|--------------------------------------|
| <input type="checkbox"/> | Procedure Overview Included | <input type="checkbox"/> | Independent Variable Usage Clarified |
| <input type="checkbox"/> | Procedure Written in General Terms | <input type="checkbox"/> | Blank Window Issue is Clarified |
| <input type="checkbox"/> | Diagram(s) Enhance Explanation | <input type="checkbox"/> | Multiple Solutions Case is Clarified |
| <input type="checkbox"/> | Appropriate / Clear Notation | <input type="checkbox"/> | No Solution Case is Clarified |
| <input type="checkbox"/> | Procedure is Valid | <input type="checkbox"/> | Result(s) Easily Identified |
| <input type="checkbox"/> | Procedure is Easy to Follow | <input type="checkbox"/> | Appropriate Calculator Detail |
| <input type="checkbox"/> | Clearly Marked Specific Steps | <input type="checkbox"/> | Smooth Transition to Example |

SPECIFIC EXAMPLE

3 pts *Processes/Strategies/Calculations used follow paper's General Procedure. They are easy to follow, accurate, complete and lead to a correct solution.*

0 pts *Processes/Strategies/Calculations used do not follow paper's General Procedure or are so unclear or contain substantial errors suggesting significant misunderstanding.*

- | | | | |
|--------------------------|----------------------------------|--------------------------|------------------------------------|
| <input type="checkbox"/> | Example Coincides with Procedure | <input type="checkbox"/> | Procedure is Correctly Implemented |
| <input type="checkbox"/> | Clearly Marked Steps | <input type="checkbox"/> | Appropriate Calculator Detail |
| <input type="checkbox"/> | Easy to Follow | <input type="checkbox"/> | Solution Easily Identified |

CONCLUSION/SUMMARY

2 pts *Conclusion/Summary is easy to ready and is consistent with the Introduction.*

0 pts *Conclusion/Summary is missing, confusing or does not fit with the Introduction.*

Some things to keep in mind...

An "A" Report

The report clearly presents the problem and its solution. The report contains the appropriate sections: Introduction, General Procedure, Specific Example, Solution, Conclusion/Summary. The Introduction contains some human interest and has a clear *statement of the problem*. The Introduction flows logically and naturally into the General Procedure. The General Procedure contains a clear, well thought-out solution process. The report includes visual aids such as diagrams that enhance the report. Variables and constants are clearly identified. Correct function notation is used. The process is described in general terms first before specific calculations are performed in the Example.

The report is reader friendly with the level of writing appropriate to the audience. It follows a common thread. There are very few if any errors in language. The report shows that the understanding of the topic goes beyond any specific examples used in class. The Summary/Conclusion provides a short recap and gives the reader clear direction for continuation.

A "C" Report

The report contains the appropriate sections but the sections are superficial. The report lacks evidence of logical reasoning, is disorganized or contains significant mathematical or language errors. All the pieces might be there and the report may even display evidence of significant effort but disorganization is rampant. The report shows evidence of minimal editing. The report is not reader-friendly; it lacks transitions or a common theme. The report reads like it was written in a hurry without much forethought or proof reading.

A "F" Report

The report does not even contain the appropriate sections. It lacks evidence of logical reasoning and it is severely disorganized. The sections are superficial and contain significant mathematical and language errors. Some of the pieces are there but the report displays evidence of minimal effort.

Introduction	Boring/Irrelevant	-	0	+	Boy do I want to read this!
Human Interest	Grass growing	-	0	+	Jurassic Park
Problem Statement	What is it?	-	0	+	Clear/Concise, Easy to Identify
Overview	Superficial	-	0	+	Clear/Concise Strategy Presented
General Procedure	All numeric, Disorganized	-	0	+	General Terms, Valid Approach, Correct
Specific Example	Superficial	-	0	+	Thorough, Correct
Summary	Hodgepodge, Random thoughts	-	0	+	Recaps key points, Answer's what's next?
Conclusion	Grass growing, the sequel	-	0	+	T-Rex invades Bend

The project must include a diagram that enhances your report. You can hand-draw or create it with computer graphics. I am happy to help with you with computer graphics. If you plan to use a word processor, you are more than welcome to stop by my office and I'll give you a quick tutorial to help in typing mathematics.

Feel free to bring a draft(s) by for my critique. I want to help you make this a project to be proud of.

SAMPLE

The TI Saves the World



INTRODUCTION

The Blob is threatening Earth. Young Johnny Algebra can save the planet from imminent destruction if he can just solve one equation. Unfortunately the equation is quite complicated and beyond even his incredible algebra skills. Fortunately, with his hand-dandy TI he has another option. But first he must review the graphic solution procedure.....

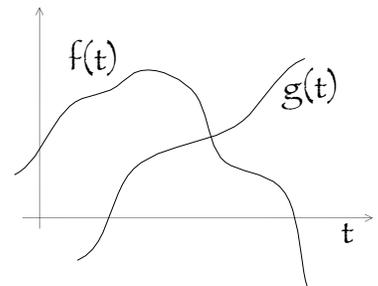
GENERAL PROCEDURE

To solve complex equations of the form $f(t) = g(t)$

Step 1

Step 2

...



SPECIFIC EXAMPLE

When the blob landed, it was 10 pounds. 1 minute later it was 20 pounds. It continued to double its size every minute. With t being time in hours, the blob's size is given by $S(t) = 10 \times 2^t$. We must find the time it takes for the blob to reach one billion pounds. That is, we must solve $S(t) = 10 \times 2^t = 10^9$.

Step 1

Step 2

...

SUMMARY / CONCLUSION

With this method at hand we can solve many equations that might seem impossible.....The Earth is now safe!