

Skills Needed for Success in Finite Mathematics

Students are often concerned about whether or not they have the mathematical skills needed to succeed in a course. The purpose of this document is to help identify some of those skills that you should already possess so that you can be successful in Math 160, Finite Mathematics.

If you find that you are weak in some of these areas, then get help. Visit the Student Learning Center and let them know you need help reviewing arithmetic and algebra skills for finite mathematics (if you just tell them you're in Math 160, they may have trouble finding someone to help), watch some of the videos in the LRC, or see the instructor.

Rounding

Here are some guidelines for rounding numbers.

- When rounding to a certain number of decimal places, use the next digit to determine whether to round up or not. If the next digit is a 5 or larger, then round your digit up. If the next digit is a 4 or lower, then leave your digit as it is.
- Always carry more decimal places through the intermediate steps than you plan to give in the final answer. If you want 2 decimals in the final answer then you should carry at least 3 (preferably more) places until you get to the final answer.
- A general rounding rule is to round the final answer to have one more decimal place than the original values. It is better to give more decimal places than needed than not enough.

Percent, Decimal, and Fraction forms

Much of the time, the information we receive will be given as a percentage. Percentages are easier for most people to comprehend because we use them in real life. But when we perform calculations, we work with decimals or fractions. Fractions are preferred in many cases, since they are exact, but decimals are easier for people to work with on a calculator. Regardless, we do not work with numbers in percent form; in fact, most calculators do not even have a percent key anymore. You will need to know how to convert between the different forms.

Percent means "per hundred" so you can think of the percent symbol as meaning "divided by 100." That is how you convert from a percent to a decimal, you simply divide by 100. A shortcut way of doing that is to move the decimal point two places to the left. To convert from a decimal to a percent involves multiplying by 100 or moving the decimal place two places to the right.

Fractions are easy to convert into decimals with a calculator. You just divide the number on top by the number on bottom. If the decimal repeats, you may put a line over the

repeating part of the decimal. For example, the calculator says that $27/110$ is 0.2454545455 , but that last digit is a rounding issue, it is exactly $0.\overline{245}$.

Solving Equations

There is an algebra prerequisite for this course. You will need to know how to solve equations and systems of equations.

Here are some examples of the type of problems you will encounter in this course.

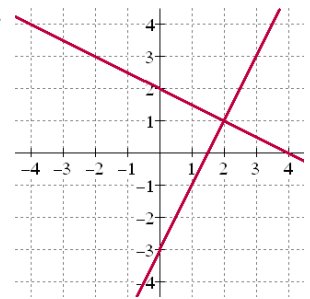
1. Consider the formula for the payment of a present value annuity,
$$PMT = PV \left(\frac{i}{1-(1+i)^{-n}} \right)$$
. Find the present value (PV) if the payment (PMT) on a 360 month (n) mortgage is \$500. The periodic rate (i) is 0.5%.
 - a. Make the substitutions into the formula $500 = PV \left(\frac{0.005}{1-(1+0.005)^{-360}} \right)$
 - b. Simplify, $500 = 0.0059955053PV$
 - c. Solve $PV = \$83,395.81$

2. Supply is given by $p = 0.5q + 3.7$ and demand is given by $p = -1.5q + 20$, where p is the price in dollars and q is the quantity in hundreds. Find the equilibrium price and quantity, where supply and demand are equal.
 - a. Since both supply and demand are p , set them equal to each other and you'll have one equation that involves just q , $0.5q + 3.7 = -1.5q + 20$.
 - b. Solve that for q to get $q = 8.15$.
 - c. Now substitute that back into either equation to find p ,
 $p = 0.5(8.15) + 3.7 = 7.775$ or $p = -1.5(8.15) + 20 = 7.775$.
 - d. The equilibrium is reached when \$7.775 per unit is charged and 815 (the 8.15 is in hundreds) units are produced.

Graphing Lines

You will need to know how to graph lines and find the intersection of two lines.

Find the intersection of $2x - y = 3$ and $x + 2y = 4$. From the graph, you can see that the solution is the point (2,1).



Matrices

This course makes heavy use of matrices that were covered in College Algebra. Luckily, most of what you will need is reviewed during the course.

Calculator Usage

This is an applied course. Almost every problem we do will be a story problem. Most of your previous math courses have been skills based; they have a skill they want you to master and they give you a problem to see if you can perform those tasks.

We will use the calculator extensively in this course. There are very few times that I ask you to do something without a calculator. Setting the problem up is the difficult part because we will use the calculator to find the answer once it is set up.

There are calculator programs that the instructor has written that will greatly reduce the work in this course. You are not expected to know how to use those, the instructor will show you how. You are expected to know how to use the basic features of the calculator including graphing equations.

Reading Comprehension

You need to be able to read, comprehend, and follow instructions. Do not jump straight to the problem without reading the instructions. Often times students will come up during a test and ask how many decimal places I want and I will point at the instructions to the problem that say "Leave answers as fractions" or "Give answers with four decimal places." Other times, the instructions might say something like "Set up the problem, but do not solve it," which could obviously save you a lot of time.

Almost every problem in this course begins as a story. You need to be able to read through the story, determine what is given and what is asked for, and then find the answer. You need to be able to comprehend what you're reading or you won't even get to the math part of the problem.