

To be successful in Mth 111 you should be fairly proficient with the following procedures / skills / concepts.

Basic Vocabulary

1. Algebra: Linear Equation, Solution, Domain, Range, Order of Operations, etc.
2. Graphing: T-table, Intercept, Root, Zero, Dependent/Independent, Domain, Range, Window, etc.

Algebra Operations

1. Factor expressions. e.g. $(a^2 - b^2) = (a + b)(a - b)$, $(a^2 + b^2)$ DNF
2. FOIL binomials. e.g. $(x + 1)^2 = x^2 + 2x + 1$
3. Simplify algebraic expressions. e.g. $x/(x + 1) + x/(x - 1) = -2x/(x^2 - 1)$
4. Apply the Rules of Exponents to simplify expressions. e.g. $(3x^2)^3 = 3^3 x^6$, $x^{-3} = 1/x^3$

Solving Equations

1. Solve linear, equations algebraically.
2. Rearrange an equation into the form $y = f(x)$. i.e. Solve for 'y'. e.g. $ay + bx = c \rightarrow y = (c - bx)/a$
3. Solve 2x2 Systems of Equations by (a) Substitution, (b) Graphing, (c) Addition Method.

Graphs and Graphing

1. Graph a line from its equation without the aid of a graphing calculator.
2. Find the equation of a line from (a) two points, (b) slope and a point, (c) graph.
3. Find the equation of a line using a parallel/perpendicular reference line.
4. Graph a function using a graphing calculator and find its critical points (roots, values, y-intercept).
5. Use a graphing calculator to find where a function reaches a specific value. e.g. find x where $y = 10$.
4. Solve (a) $f(t) = g(t)$ by the intersection method, (b) Solve $f(t) = 0$ by the root method.

Functions (include algebraic form, graphic form, tabular form)

1. Distinguish dependent vs. independent variable.
2. Give the domain and range of a function from its graphic, narrative, algebraic and tabular forms.
3. Use appropriate notation to describe an interval. e.g. $[-1, \infty) \rightarrow -1 \leq x < \infty \rightarrow x \geq -1$
4. Graph a function in a 'friendly' window. i.e. Find an appropriate window without relying on ZoomFit

Mathematical Models

1. Identify the independent vs. the dependent variable.
2. Use a mathematical model given in an algebraic or graphic form to draw conclusions, make predictions and analyze behavior inherent in the model.
3. Set up and solve classic algebra applications (word problems): Mixtures, DRT, Interest, Falling Body, etc.

Writing and Working in a Group

1. Effectively communicate mathematical concepts in writing using correct mathematical notation.
2. Work collaboratively with your peers on projects or activities to explore mathematical concepts.