To be successful in Mth 111 you should be fairly proficient with the following procedures / skills / concepts. Place a ✓ next to the number of the items you feel you understand (can do correctly) and place a '?' next to the number if you are unsure.

Basic Vocabulary

1. Algebra: Equations/Expression, Variable/Parameter, Polynomial, Linear, Quadratic, Order of Operations, etc.

2. Graphing: T-table, Slope, Intercept, Root, Zero, Dependent/Independent, Domain, Range, Window, Table, 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. $(3x^2)^3 = 3^3 x^6$, $x^{-3} = 1/x^3$

5. Perform arithmetic with Complex numbers. e.g. $(1 + i)(1 - i) = 2$

Solving Equations

1. Solve linear, quadratic, radical and rational equations algebraically.

2. Solve equations containing an absolute value.

3. Apply the Quadratic Formula.

4. Rearrange an equation into the form $y = f(x)$. i.e. Solve for 'y'. e.g. $ay + bx = c \rightarrow y = (c - bx)/a$

5. Solve (a) $f(t) = g(t)$ by the intersection method, (b) Solve $f(t) = 0$ by the root method, (c) Solve $f(t) = k$ by tables.

6. Solve 2×2 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, extrema, y-intercept)

5. Use a graphing calculator to find where a function reaches a specific value. e.g. find x where $f(x) = 10$.

6. Apply the Pythagorean Theorem to random right triangle.

7. Find the distance between two points on the (x, y) coordinate system.

8. Find the midpoint between two points on the (x, y) coordinate system.

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

1. Distinguish dependent vs. independent variable.

2. Evaluate functions with (a) a change of variable, (b) at a value, (c) with a new expression. $f(x) \rightarrow f(t)$, $f(2)$, $f(a + b)$

3. Give the domain and range of a function from its graphic form.

4. Give increasing or decreasing intervals.

5. Use appropriate notation to describe an interval. e.g. $[-1, \infty) \rightarrow -1 \leq x < \infty \rightarrow x \geq -1$

6. Graph a function in a 'friendly' window. i.e. Find an appropriate window without relying on ZoomFit

Quadratics

1. Graph a quadratic and identify the four critical points: roots, vertex and y-intercept.

2. Switch between the key quadratic forms:

$$y = ax^2 + bx + c \ \leftrightarrow \ y = a(x - h)^2 + k \ \leftrightarrow \ y = a(x - r_1)(x - r_2)$$

3. Find the equation of a quadratic from:

   (a) two roots and a third point, (b) vertex and a third point, (c) three random points (regression OK)

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.

Miscellaneous

1. Graph a circle

2. Find the equation of a circle from its graph or description

3. Apply the Pythagorean Theorem to random right triangle.

4. Find the distance between two points on the (x, y) coordinate system.

5. Find the midpoint between two points on the (x, y) coordinate system.

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.

What is your Major/Program at COCC?

Last Math Class Taken

What was it?	*When Was it?*	*How did you do?*	*Do you remember the material?*

Is(are) there a particular topic(s) you would like to have reviewed?