

Course Title & Number: _____MA172 College Algebra_____

Competency Area: **QUANTITATIVE REASONING** (Goal: Students will learn to recognize, understand, and use the quantitative elements they encounter in various aspects of their lives. Students will develop a habit of mind that uses quantitative skills to solve problems and make informed decisions.)

Faculty submitting the Learning Outcomes: Katie Lozo, Ruth Urbina-Lilback, Jane Wampler, Harry Burt

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[Instructions: Please match the Learning Outcomes in the left hand column to those of the course you are submitting for Gen Ed approval. List the corresponding course outcomes in the right hand column to indicate a match.]

BOR TAP's Learning Outcomes	Corresponding Outcomes for Course Named Above
1. Represent mathematical and quantitative information symbolically, graphically, numerically, and verbally.	<ul style="list-style-type: none">A. Analysis of Functions —<ul style="list-style-type: none">Algebraically and graphically analyze various functions (polynomial, radical, rational, piecewise, logarithmic, exponential and power); analysis of functions includes determining asymptotes, symmetry, increasing and decreasing intervals, maxima, minima.Perform arithmetic operations on functions. -Analyze operations of composite functions.Given a function, develop its inverse.Determine domain and range of a function.D. Solving Equations and Inequalities—<ul style="list-style-type: none">Find roots of polynomials algebraically and graphically.Solve radical equationsSolve rational and quadratic inequalitiesSolve quadratic equations with complex roots.E. Polynomial, Rational and Radical Functions —<ul style="list-style-type: none">Analyze power functions and higher degree polynomials.Solve applications involving polynomial, rational and radical functions.G. Exponential and Logarithmic Functions —<ul style="list-style-type: none">Graph exponential and logarithmic functions.Study base e and its applications.Apply properties of logs.

	<ul style="list-style-type: none"> • Convert logs with bases other than 10 or e. • Solve applications containing exponential and logarithmic equations.
2. Apply quantitative methods to investigate routine and novel problems. This includes calculations/procedures, mathematical and/or statistical modeling, prediction, and evaluation.	<p>A. Analysis of Functions —</p> <ul style="list-style-type: none"> • Algebraically and graphically analyze various functions (polynomial, radical, rational, piecewise, logarithmic, exponential and power); analysis of functions includes determining asymptotes, symmetry, increasing and decreasing intervals, maxima, minima. • Perform arithmetic operations on functions. - • Analyze operations of composite functions. • Given a function, develop its inverse. • Determine domain and range of a function. <p>E. Polynomial, Rational and Radical Functions —</p> <ul style="list-style-type: none"> • Analyze power functions and higher degree polynomials. • Solve applications involving polynomial, rational and radical functions. <p>F. Complex Numbers —</p> <ul style="list-style-type: none"> • Perform arithmetic operations. • Compute powers of i. <p>G. Exponential and Logarithmic Functions —</p> <ul style="list-style-type: none"> • Graph exponential and logarithmic functions. • Study base e and its applications. • Apply properties of logs. • Convert logs with bases other than 10 or e. • Solve applications containing exponential and logarithmic equations.
3. Interpret mathematical and quantitative information and draw logical inferences from representations such as formulas, equations, graphs, tables, and schematics.	<p>E. Polynomial, Rational and Radical Functions —</p> <ul style="list-style-type: none"> • Analyze power functions and higher degree polynomials. • Solve applications involving polynomial, rational and radical functions. <p>G. Exponential and Logarithmic Functions —</p> <ul style="list-style-type: none"> • Graph exponential and logarithmic functions. • Study base e and its applications. • Apply properties of logs.

	<ul style="list-style-type: none"> • Convert logs with bases other than 10 or e. • Solve applications containing exponential and logarithmic equations.
4. Evaluate the results obtained from quantitative methods for accuracy and/or reasonableness.	Evaluate the results obtained from quantitative methods for accuracy and/or reasonableness.
	<p><i>Additional Outcomes</i></p> <p>B. Techniques of Graphing —</p> <ul style="list-style-type: none"> • Apply transformations (translation, stretch, compression, reflection). • Combine these graphing procedures. <p>C. Systems of Equations —</p> <ul style="list-style-type: none"> • Use algebraic and graphic methods to create mathematical models to solve multivariate problems. <p>H. Mathematical Modeling and Curve Fitting (as time permits) —</p> <ul style="list-style-type: none"> • Draw scatter diagrams. • Curve fit bivariate data. • Solve problems involving quadratics, power functions and higher degree polynomials by curve fitting. • Determine a function of best fit and use its equation to make predictions.