

**In Math 1010, students learn how to:**

- Work with functions presented in tables, graphs, with algebraic expressions, or in words. Determine if relations presented in any of these formats are functions.
- Find the domain, x-intercepts, y-intercepts, output given input, and input given output for functions presented with tables, graphs, or algebra. Find the range of functions presented graphically.
- Know the shapes of the graphs of linear, exponential, logarithmic, quadratic, square root, power, and nth-root functions. Be able to recognize when a sufficient portion of the graph is sketched in order to indicate the graph shape.
- Decide if a given function is linear, quadratic, exponential, or none of the above for functions presented algebraically, graphically, or in tables.
- Graph the following functions:
  - Graph linear functions using either two points or one point and a slope.
  - Graph quadratic functions by finding the vertex, symmetry, and using other points such as the x-intercepts and y-intercept.
  - Graph logarithmic functions with no transformations.
  - Graph exponential and square root functions, when given in transformation form.
  - Graph power functions and nth-root functions with no transformations.
- Solve linear, quadratic, exponential, logarithmic and square root equations. Solve quadratic equations using factoring, completing the square, and the quadratic formula.
- Determine the slope of a line; find the equations of lines given information about them. Decide if lines are parallel, perpendicular, or neither.
- Solve 2x2 systems of linear equations and functions using graphical and substitution methods.
- Be able to factor quadratic expressions or decide if they cannot be factored; complete the square.

- Perform composition of functions presented with tables, graphs, or algebra.
- Decide if a function presented with a table or graph is invertible and give the inverse in the same format.
- Find the algebraic inverse of a linear function presented algebraically.
- Use exponent rules to simplify exponential expressions.
- Understand  $n$ th-roots, rational exponents and the connection between the two.
- Simplify  $n$ th roots and exponential expressions with rational exponents.
- Construct algebraic models to describe real life situations. Be able to decide whether a linear, exponential, or quadratic model fits a situation best.
- Analyze linear, exponential, and quadratic models to answer questions about the situations they represent. In particular, relate graphical features (like the  $x$ - and  $y$ -intercepts of all functions or the vertex of a parabola) to specific aspects of the situation being modeled.