# MATH 30 - Precalculus. Review for test 1. Professor Luis Fernández

## Topics and skills that will be evaluated

### Functions and graphs

- Given the algebraic expression of a function (that is, the formula for $f(x)$), find the value of the function for any value of the input (that is, plug in the value of $x$). This includes functions defined piecewise (Sec. 1.2)
- Given the algebraic expression of a function, compute the difference quotient (p. 180) (Sec. 1.3).
- Given the algebraic expression of a function, determine if the function is even, odd, or neither (Sec. 1.3).
- Given a graph, determine whether it is the graph of a function (vertical line test) (Sec. 1.2).
- Given the graph of a function, find the domain, range; intervals where the function is increasing, decreasing, or constant; relative maximum and minimum values (both $x$-values and $y$-values); $x$ and $y$-intercepts; whether the function is even, odd, or neither (Sec. 1.2, 1.3).
- Identify and be able to graph transformations of functions (shifts, reflections, stretching and shrinking) (Sec. 1.6).
- Given the algebraic expression of a function, find its domain (Sec. 1.7).
- Given the algebraic expression of two or more functions, find the expression for the sum, difference, product, quotient and composition of the functions (Sec. 1.7).
- Given the graphs, or given some values of two or more functions, find function values of the sum, difference, product, quotient and composition of the functions (Sec. 1.7).
- Understand the definition of inverse of a function, and be able to find some values of the inverse given the values of the function (Sec. 1.8).
- Given the algebraic expression of a function, find the expression of its inverse (Sec. 1.8).
- Understand the definition of one to one functions. Be able to determine if a function is one to one given its graph (horizontal line test) (Sec. 1.8).
- Given the graph of a function, sketch the graph of its inverse (Sec. 1.8).

### Angles and trigonometry

- Graph any angle given in degrees (Sec. 4.1).
- Convert between radians and degrees (Sec. 4.1).
- Graph and identify the most common angles, both in radians and degrees (Sec. 4.1).
- Find coterminal angles to a given one (Sec. 4.1).
- Know the value of sine and cosine of the most common angles (Sec. 4.2).

### Some useful exercises from the textbook:

- Sec. 1.2: Page 168: 33, 35, 37. Page 169: 71, 72, 73, 75.
- Sec. 1.3: Page 182: 9, 11, 13. Page 183: 17, 19, 33, 35, 37, 39, 55, 59.
- Sec. 1.6: Page 227: 17 to 32.
- Sec. 1.7: Page 242: 3, 7, 9, 17. Page 243: 51, 53, 55, 57, 59.
- Sec. 1.8: Page 278: 1, 3, 5, 11, 15, 25, 27, 35, 37.
- Sec. 4.1: Page 532: 13, 15, 21, 23, 29, 25, 41–56, 61, 65, 69.
- Sec. 4.2: Page 278: 1, 3, 5, 11, 15, 25, 27, 35, 37.

### Other materials:

- There are 4 tests from previous semesters that you can download from the webpage. The test will have some exercises similar to these.