

Topic #5: Continuity (Math 31)

1. Goals
 - a. Continuity
2. CONTINUITY
 - a. Pictures showing
 - b. Significance:
 - i. Discuss real life examples of continuity:
 1. Distance with time
 2. Height with time
 3. Temperature with position.
 4. Fixed Point Theorem and Liquid.
 - c. Definition
 - i. Informal: Continuous at a if can draw it near a without lifting your pen.
 - d. Three kinds of discontinuity:
 - i. Removable
 - ii. Jump
 - iii. Infinite
3. FORMAL DEF AND FACTS
 - a. Formal def, 3 parts:
 - i. Limit exists
 - ii. Function defined
 - iii. Limit = Function Value.
 - b. Examples:
 1. Polynomials
 2. Rational functions, root functions, trig functions (where defined)
 3. Piecewise functions
 4. Ex 2.28 (page 183)
 - c. Facts about continuity
 - i. Sum, Product, Quotient at a point.
 - ii. Composition: If f and g are both continuous everywhere, then so is composition
 - iii. $\lim f(g(x)) = f(\lim x)$ for f continuous
4. Expanding continuity.
 - a. Continuity left/right.
 - b. Continuity on open interval
 - c. Continuity on closed interval