Notesheet. Section 2.5 (Continuity) Part I
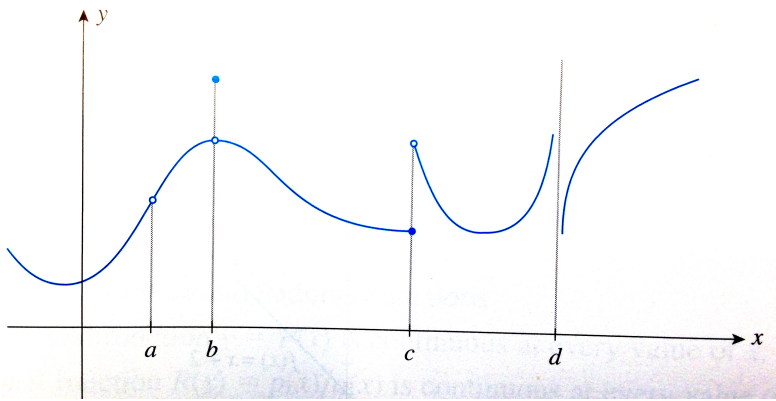
Math 1210

Example 1. The function whose graph is depicted below is *not* continuous at $x = a$, b, c, nor d. At all other values of x, the function is continuous.

Definition 2. A function f is continuous at a number $x = a$ if the following 3 conditions are satisfied:
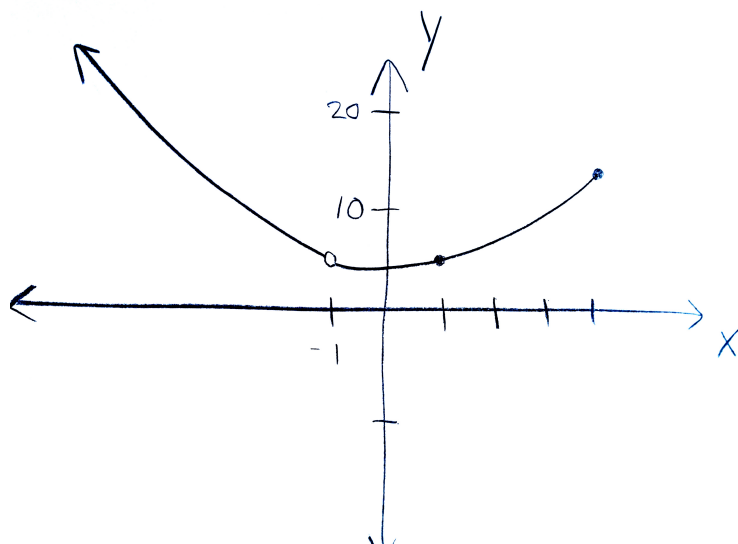
Definition 3. Given a function $f(x)$, when is $f(x)$ **discontinous** at a point? When is $f(x)$ **continuous on an interval**?

Challenge 4. Find the values of x for which each function is continuous. Use interval notation when appropriate.

(a) $f(x) = \dfrac{x^2 - 49}{x + 7}$

(b) $h(x) = \begin{cases} 1 & \text{if } x < 0 \\ \dfrac{x+2}{2} & \text{otherwise} \end{cases}$

Challenge 5. Is the function graphed below continuous at -1? Is it continuous at 1? At 2? At 4? At 5?

Theorem 6. Properties of (facts about) continuous functions:

(a) The constant function

(b) The identity function

    If f and g are continuous at $x = p$, then:

(c) $f(x)^n$

(d) $f \pm g$

(e) fg

(f) f/g