Math 1210-2
Tuesday Sept 18

§1.4 (finish first), then §1.6 continuity

↓

page 3 Monday.

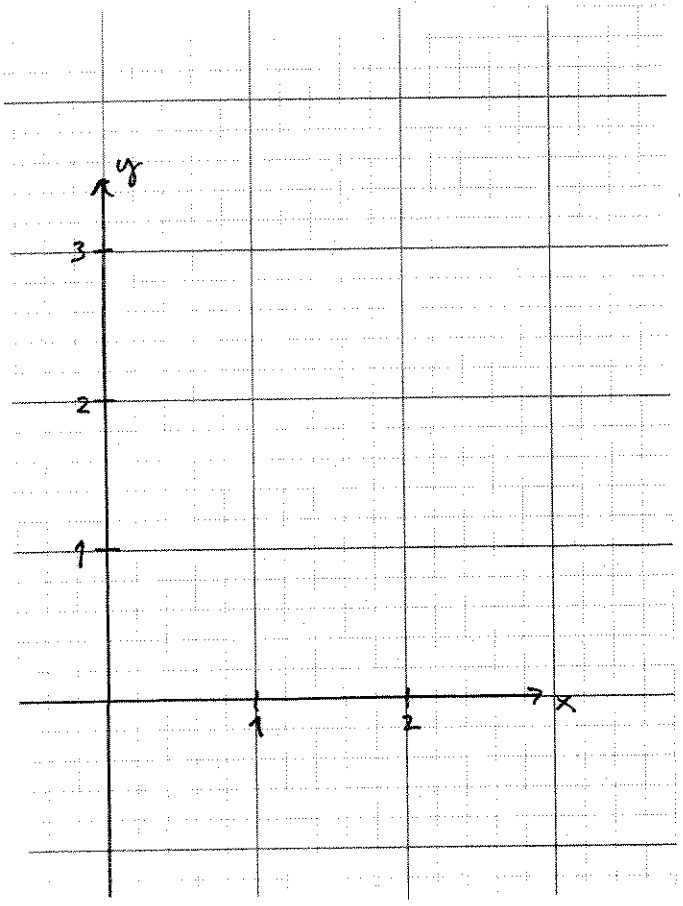
§1.6

Recall, $f(x)$ is continuous at $x=c$ means $\lim_{x \to c} f(x) = f(c)$

Exercise 1 Let $f(x) = \begin{cases} x^2+1 & x \leq 1 \\ -x+3 & x > 1 \end{cases}$

(a) Sketch the graph of f

(b) Is $f(x)$ continuous at $x=1$?



Exercise 2 Let $g(x) = \begin{cases} (x-1)^2 + a, & x < 2 \\ x-2 & x \geq 2 \end{cases}$

For what value of a is $g(x)$ continuous at $x=2$?

Exercise 3 : Let $f(x) = \dfrac{x^3 - 3x^2 + 2}{x^2 - 1}$

(a) What is the natural domain of f?

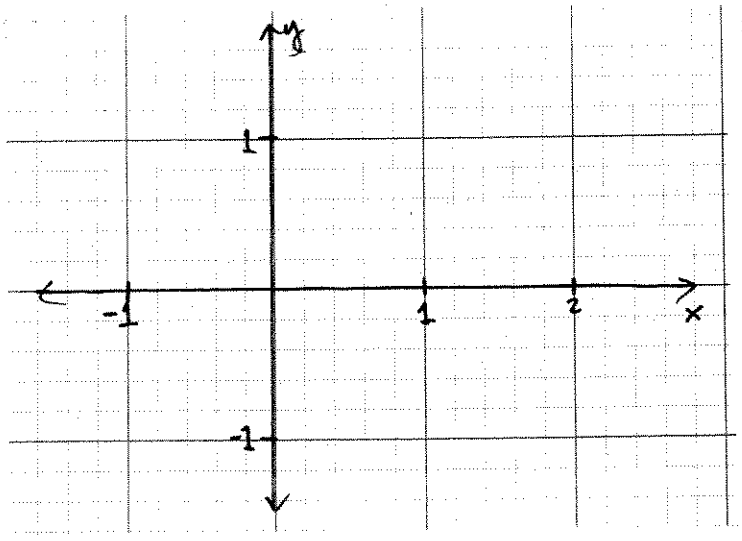
(b) can you define $f(1)$ so that $f(x)$ is continuous at $x = 1$?

(c) Can you define $f(-1)$ to make $f(x)$ continuous at $x = -1$?

Exercise 4 Let $f(x) = \begin{cases} \dfrac{|x|}{x} & x \neq 0 \\ 1 & x = 0 \end{cases}$

(a) Is $f(x)$ continuous at $x = 0$?

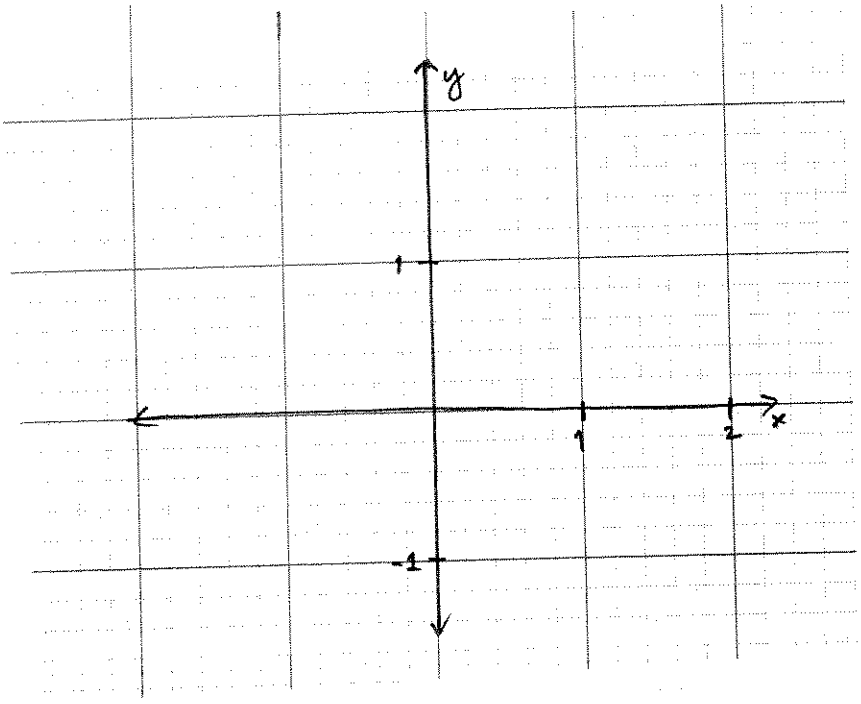
(b) Sketch $y = f(x)$



Exercise 5 Let $f(x) = \begin{cases} x \sin\frac{1}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$

(a) Is $f(x)$ continuous at $x = 0$?

(b) Can you make a rough sketch of the graph of f?



Exercise 6 The graph of a function $y = f(x)$ is shown. Discuss the continuity of $f(x)$. At points where f is not continuous, is it continuous from the right ($\lim_{x \to c^+} f(x) = f(c)$) or from the left? ($\lim_{x \to c^-} f(x) = f(c)$).