

# Wednesday, January 25, Group work

Monday, January 23, 2023

21:39

**NOTE:** Group work will be due Monday, 1/30 at 11:59 pm on Gradescope

**Due date:** upload to gradescope by 11:59 pm ~~two days~~ after this is handed out

*Monday*

Every week we plan to work in small groups of about four students to learn to write proofs and to solve problems. I will grade each group's work.

- *Scribe:* each week, someone in the group will volunteer to submit to Gradescope the group's answer *along with group member names.* This role should rotate through the group.
- *Respect:* when discussing problems, please make sure that everyone feels comfortable speaking and that all feedback is supportive and encouraging.
- Please keep your group name so you can rejoin the same group each week.

**Problem 1** The toll ticket taker notices that I took 2 hours to drive 150 miles on the Mass Pike, which has a speed limit of 70 mph. Why can they give me a ticket for going 75 mph at least once on the trip?

**Problem 2** Let  $f: \mathbb{R} \rightarrow \mathbb{R}$  be differentiable on  $\mathbb{R}$ . Assume  $f'(x) < 1$  for all  $x \in \mathbb{R}$  and  $f(0) = 1$ .

- (a) Prove that  $f(x) < 1 + x$  for all  $x > 0$ .
- (b) What can you say about  $f(x)$  for  $x < 0$ ?

*} don't use FTC*

*Front*

*Northen* *Cox*  
*Klyradia* *Kovalerzhyn*  
*Bisackwell* *Chen*