

# Homework 14

Math 147, Fall 2023

This homework is due on Friday, October 17 (at the start of recitation). *Turn in (via Gradescope) your answers to questions 1–3.*

0. Read Section 5.4
1. Find two numbers whose difference is 10 and whose product is as small as possible.
2. (a) Graph  $f(x) = \cos x$  with domain  $[-2\pi, 2\pi]$  (from memory or using a graphing calculator).  
(b) Mark and label all extrema (local and global) and inflection points.  
(c) Use derivative tests to confirm your answers to (b).
3. Section 5.4 #4, 6, 10, 12, 24(a–b)
4. (These problems are *not* to be turned in!)
  - (a) Section 5.4 # 1, 3, 5, 7, 9, 11, 13, 14, 15, 17, 19
  - (b) Find the point on the line  $y = 3x - 2$  that is closest to the origin.
  - (c) Sketch graphs of the following functions (show your work):
    - (i)  $x(x - 4)^3$
    - (ii)  $\frac{(x-1)^2}{x^2+1}$
    - (iii)  $\frac{x}{x^3-1}$