Quiz #9, 3/30
Math 157 (Calculus II), Spring 2023

Problem 1 is worth 5 points (2.5 pts each part), and Problem 2 is worth 5 points (1 pt each part), for a total of 10 points. Remember to *show your work* on all problems!

1. For each of the following sequence limits, compute the limit or explain why it does not exist.

   (a) $\lim_{n\to\infty} \dfrac{3n^2+4}{2n^2+5n+1}$

   (b) $\lim_{n\to\infty} \sin\left(\dfrac{\pi}{2}+\dfrac{\pi}{n}\right)$

2. For each of the following sequences $\{a_n\}_{n=1}^{\infty}$, state whether it is: (i) increasing, decreasing, or neither; (ii) bounded, or unbounded; (iii) convergent or divergent.

   (a) $a_n = n^2$

   (b) $a_n = (-1)^n \cdot n^2$

   (c) $a_n = \frac{1}{n}$

   (d) $a_n = \frac{(-1)^n}{n}$

   (e) $a_n = (-1)^n$