NAME: ID:

MATH 317 Q1 WINTER 2017 QUIZ 6

Apr. 7, 2017, 25 minutes

- The quiz has 3 problems. Total 10 + 1 points.

QUESTION 1. (5 PTS) *Let* $f(x) := \sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{2n+1}$. *Determine the domain of* f *and obtain an explicit formula for* f. *Justify your calculation.*

QUESTION 2. (5 PTS) *Calculate the Fourier series for the function* $f(x) = \begin{cases} -\pi & -\pi < x < 0 \\ x & 0 < x < \pi \end{cases}$.

QUESTION 3. (1 BONUS PT) *Find the sum* $\sum_{n=1}^{\infty} \frac{1}{n^2+1}$ *by considering the Fourier series of* e^{-x}.