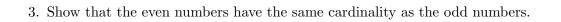
## Worksheet 3

- 1. Complete the following definitions.
  - (a) We say for two sets A and B that  $|A| = |B| \dots$
  - (b) We say a sequence  $x_n \to x \dots$
  - (c) We say a sequence  $x_n \to \infty \dots$

- 2. True or False.
  - (a)  $|\mathbb{Q}| = |\mathbb{R}|$
  - (b)  $|\mathbb{N}| = |\mathbb{Q}|$
  - (c) For any set A we have  $|A| \neq |P(A)|$  where P(A) is the power set of A.
  - (d)  $|x y| \ge ||x| |y||$
  - (e)  $|x y| \ge |x| + |y|$



4. Show that  $\{\frac{1}{n^2+1}\}_{n=1}^{\infty}$  converges by monotone sequence theorem.

5. Show that the sequence  $\left\{\frac{n^2+1}{n}\right\}_{n=1}^{\infty}$  diverges to infinity.