640:300 WORKSHOP 10
SURJECTIVE AND INJECTIVE FUNCTIONS

(1) Decide if the following map is surjective, injective, bijective?

(a) $f : \mathbb{R} \to [-1, 1]$, $f(x) = \cos(x)$;

(b) $f : \mathbb{R} \times \mathbb{R} \to \mathbb{R}$, $f(x, y) = x - 2y$;

(c) $f : [0, \infty) \to (0, 1]$, $f(x) = 1/(x^2 + 1)$.

(2) Construct bijections between

(a) $\mathbb{N}$ and $\mathbb{N} \setminus \{1, 3\}$;

(b) $\mathbb{R}$ and $\mathbb{R}_{>0}$ (*Hint*: some well-known function from calculus may be useful...)