

### Writing Assignment 3: Due Wednesday, September 14

**Problem 1:** Define  $f: \mathbb{Z} \rightarrow \mathbb{Z}^2$  by letting  $f(n) = (3n^2 - 77, 5n + 6)$ . Is  $f$  injective? Explain.

**Problem 2:** Define  $f: \mathbb{R}^2 \rightarrow \mathbb{R}$  by letting  $f((x, y)) = x^2 - 3y - 4$ . Is  $f$  surjective? Explain.

**Problem 3:** Define  $f: \mathbb{Z}^2 \rightarrow \mathbb{Z}$  by letting  $f((x, y)) = 12x + 20y$ . Show that  $\text{range}(f) = \{4k : k \in \mathbb{Z}\}$ .