

## Quiz 5

1. Let  $\xi$  be a irrational number. Given a positive integer  $b$ , let  $a$  denote the integer closest to  $b\xi$ . Prove that

$$|b\xi - a| < \frac{1}{2}.$$

2. Prove that if  $d$  is a negative or a perfect square, then the Pell's equation

$$x^2 - dy^2 = N$$

has only finitely many integral solutions.