

## Quiz 4

Show your work and explain everything. Answers only won't be accepted. Full explanation is required.

- (1) (8 points) Find  $\gcd(a, b)$ , find integers  $\alpha$  and  $\beta$  such that  $\gcd(a, b) = \alpha a + \beta b$ , and find  $\text{lcm}(b, -a)$ , where  $a = 100$  and  $b = 47$ .

- (2) (4 points) Find the canonical factorization of 360.

- (3) Find the following in  $\mathbb{Z}_{100}$ :

(a) (1 point)  $27 \oplus 10$ .

(b) (1 point)  $-47$ .

(c) (3 points)  $47^{-1}$  (*Hint: use the first question*).

- (4) (3 points) Solve the following equation:  $2x \equiv 0 \pmod{6}$ .