

## Worksheet §6

1. Let  $f(x) = x^3 - 43x^2 + 17$ . Find the remainder when we divide  $f(63002)$  by 7.
2. Let  $x, y \in \mathbb{R}$ . Prove that if  $x$  is rational and  $y$  is irrational, then  $x + y$  is irrational.
3. Show that if  $a, b, c, d, n \in \mathbb{Z}$ ,  $n > 0$  satisfy

$$a \equiv c \pmod{n} \text{ and } b \equiv d \pmod{n},$$

then  $ab \equiv cd \pmod{n}$ .