(1) Can n be written as $n = x^2 + y^2$, where x and y are integers, when
   (a) $n = 1098$
   (b) $n = 4067$

(2) (a) Show that $\sqrt{65} = [8; \overline{16}]$.
   (b) Find the smallest solution (x, y) in positive integers of the diophantine equation $x^2 - 65y^2 = 1$.

(3) Factorise the gaussian integer $45 + 60i$ into gaussian primes.

(4) Solve the congruence $x^3 + 2x^2 + x + 1 \equiv 0 \pmod{5^2}$

(5) (a) Find a primitive root of 11.
   (b) Make a table of indices modulo 11 with respect to this primitive root.
   (c) Find all integers $x \geq 0$, such that $7^x \equiv 3 \pmod{11}$.

(6) Decide if the congruence $3x^2 + x + 6 \equiv 0 \pmod{59}$ has any solutions or not.