```
> restart:
```

Question 4B:

```
> `mod` := mods:
  chin_result := chrem([x^2 + 2*x + 4, x^2 + 3*x + 6], [5, 7]):
  printf("\nThe polynomial u(x) in the symmetric range Z mod 35 is:
  %a.\n", chin_result);

The polynomial u(x) in the symmetric range Z mod 35 is: x^2+17*x-1.
```

Question 4D:

```
> poly_A := x^4 + x^3 + x + 1:
  poly_B := x^3 + 1:
  char_F := 2:
  printf("\nInput Polynomials:\nA: %a.\nB: %a.\n", poly_A, poly_B);

Input Polynomials:
A: x^4+x^3+x+1.
B: x^3+1.

> res_one := expand(poly_A * poly_B) mod char_F:
  printf("\n A*B in Z mod 2 is: %a.\n", res_one);

 A*B in Z mod 2 is: x^7+x^6+x+1.

> res_two := Gcdex(poly_A, poly_B, x) mod char_F:
  printf("\n The monic GCD of A,B in Z mod 2 is: %a.\n", res_two);

 The monic GCD of A,B in Z mod 2 is: x^3+1.

> res_three := Rem(poly_A, poly_B, x) mod char_F:
  printf("\n The remainder of A,B in Z mod 2 is: %a.\n", res_three)
  ;

 The remainder of A,B in Z mod 2 is: 0.

> res_four := Gcdex(poly_A, poly_B, x, 's', 't') mod char_F:
  printf("\n The monic GCD of A,B in Z mod 2 is: %a and the value
  of S and T is: %a and %a respectively.\n", res_four, s, t);

 The monic GCD of A,B in Z mod 2 is: x^3+1 and the value of S and T
is: 0 and 1 respectively.
```

```
> (* Chinese Remainder Problem *)

  crp := proc(u1::polynom, u2::polynom, m1::polynom, m2::polynom,
  p::posint)

  local U, U_1, U_2, M_1, M_2, V_1, V_2, P:
  U_1, U_2, M_1, M_2, P := u1, u2, m1, m2, p:

  V_1 := Rem(U_1, M_1, y) mod p:
  printf("\nValue of V1: %a.\n", V_1);
  Gcdex(M_1, M_2, y, 's', 't') mod p:
  printf("The inverse of M1: %a.\n", s);

  V_2 := Rem((U_2-U_1)*s, M_1, y) mod p:
  printf("Value of V2: %a.\n", V_2);

  U := (V_1 + V_2*M_1) mod p:
  U := expand(U) mod p:

  return printf("Recovered U: %a.\n", U);
  end proc:
```

```
> u_1, u_2 := y^2, y^2 + y + 1:
  m_1, m_2 := y^3 + y + 1, y^3 + y^2 + 1:

  crp(u_1, u_2, m_1, m_2, 2):

Value of V1: y^2.
The inverse of M1: y.
Value of V2: y^2+y.
Recovered U: y^5+y^4+y^3+y^2+y.
```