```
> # Recurrence and initial conditions
  eq := u(i) - 2*u(i-1) - u(i-2) + 2*u(i-3) = 0:
  IC := { u(0) = 7, u(1) = 1, u(2) = 13 }:

  # (2) Explicit (non-recursive) solution
  sol := rsolve( {eq, op(IC)}, u(i) ):
  simplify(sol);

  # (1) Next terms using the explicit solution (you could also loop the recurrence)
  u3 := eval(sol, i = 3):
  u4 := eval(sol, i = 4):

  # (3) u_30 using the explicit solution
  u30 := eval(sol, i = 30):

  # Display
  printf("u3 = %a\nu4 = %a\n", u3, u4);
  printf("u_i = %a\n", sol);     # should simplify to 1 + 4*(-1)^i + 2^(i+1)
  printf("u30 = %a\n", u30);
```

$$2^{i+1} + 1 + 4\,(-1)^{i}$$

```
u3 = 13
u4 = 37
u_i = 2*2^i+1+4*(-1)^i
u30 = 2147483653
```

```
> (: Done
```